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ABSTRACT

This information resources management (IRM) bibliography provides abstracts of reports and journal articles entered in the National Aeronautics and Space Administration (NASA) scientific and technical information system over a 6-year period. These abstracts are presented in 10 areas: (1) IRM activities and planning; (2) computers, telecommunications, and networks; (3) artificial intelligence, expert systems, and knowledge systems; (4) the human interface; (5) decision support; (6) applications to special areas; (7) management information systems; (8) scientific and technical information and libraries; (9) systems security; and (10) intellectual property. Seven separate indexes provide access to these abstracts by subject, personal author, corporate source, contract number, report number, and accession number. National Technical Information Service (NTIS) order numbers are provided for the items cited and a current NTIS price schedule (effective January 1, 1990) lists North American and foreign prices for standard and exception price documents and microfiche. (MAB)

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Information Resources Management 1984-1989 A Bibliography with Indexes

NASA SP-7079
May 1990

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National Aeronautics and Space Administration

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INFORMATION RESOURCES MANAGEMENT

A BIBLIOGRAPHY WITH INDEXES 1984-1989

A selection of annotated references to reports and journal articles entered into the NASA scientific and technical information system from 1984 through 1989.

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National Aeronautics and Space Administration
Office of Management
Scientific and Technical Information Division
Washington, DC 1990

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FOREWORD

The concept and initiation of information resources management (IRM) has been one of the most important events in the information technology arena since the introduction of the computer. In its simplest form, IRM is the management of information and the associated technology and people in a manner consistent with the successful performance of agency missions and programs. The Paperwork Reduction Act of 1980 established the Federal IRM program and led to its initiation in Federal agencies.

NASA has a major role in implementing IRM, especially in the scientific and technical areas. NASA missions are information-intensive efforts, designed to gather data which can be reduced to information to yield knowledge. These missions must be planned with an end-to-end life cycle concern for the collection, transmission, storage, and retrieval of information. The IRM principles of information asset management and life cycle management are becoming a major part of NASA planning in the scientific, engineering, and administrative data processing areas.

As with any management concept or tool, IRM must be integrated into an organization's structure and management approach. NASA is structured and managed in a decentralized manner, with the programs and centers providing strong operational leadership for their assigned activities. Thus, within an overall framework of IRM principles established by NASA Headquarters, the NASA programs and centers implement IRM constructs appropriate to their needs and requirements. Because of the various programs, missions, and structures within NASA, there is a need for information on how to incorporate IRM principles into a number of different environments.

One of the key IRM tenets is the reuse of resources whenever appropriate. Recent documentation on IRM constitutes a valuable resource showing what others have thought, tried, and learned. We offer this IRM bibliography in the hope that you will find it stimulating and useful.

C. Howard Robins, Jr., *Associate Administrator,*
Office of Management

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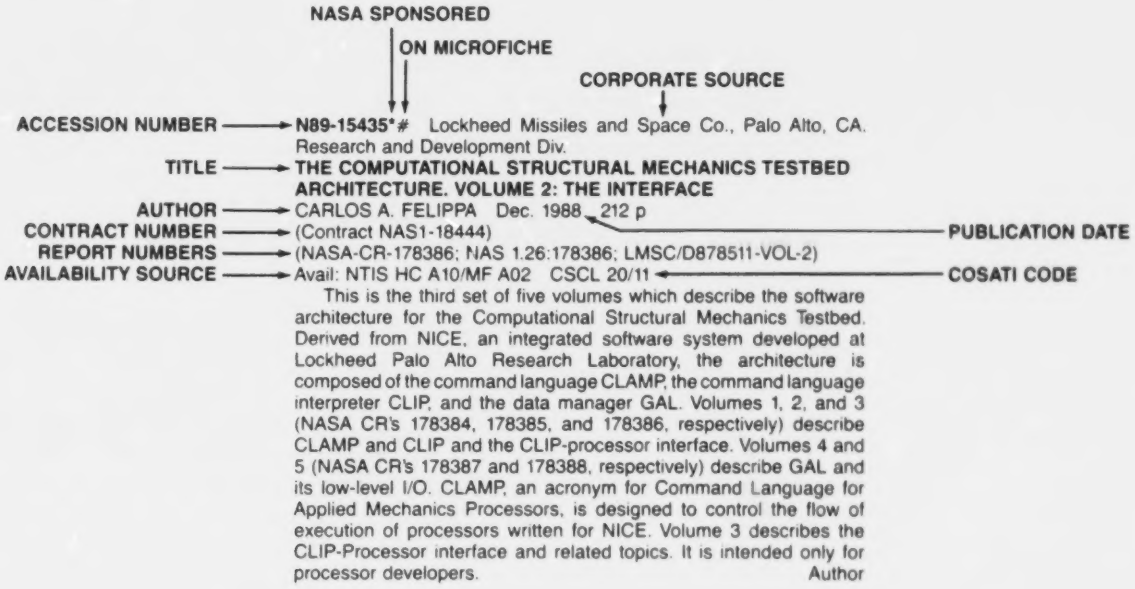
TYPICAL REPORT CITATION AND ABSTRACT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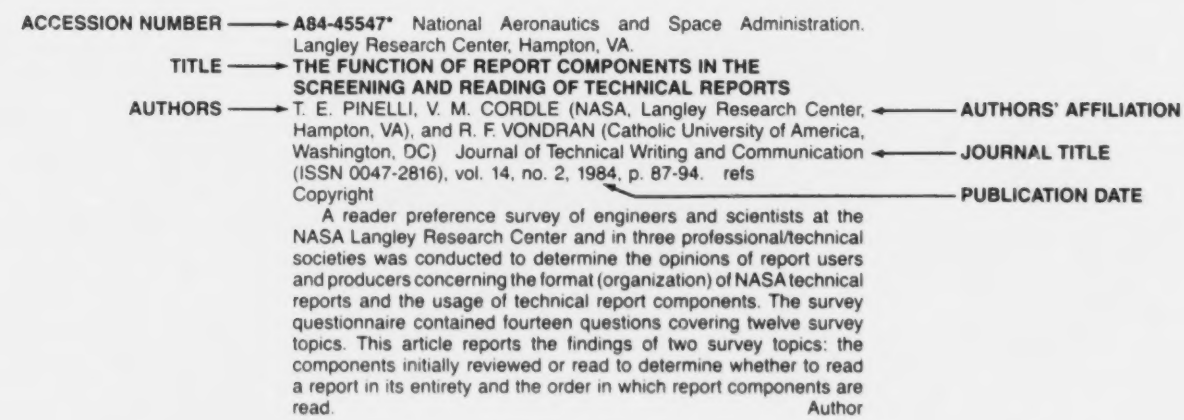
ACCESSION NUMBER
N89-15435*# Lockheed Missiles and Space Co., Palo Alto, CA. Research and Development Div.
TITLE
THE COMPUTATIONAL STRUCTURAL MECHANICS TESTBED ARCHITECTURE. VOLUME 2: THE INTERFACE
AUTHOR
CARLOS A. FELIPPA Dec. 1988 212 p
CONTRACT NUMBER
(Contract NAS1-18444)
PUBLICATION DATE
REPORT NUMBERS
(NASA-CR-178386; NAS 1.26:178386; LMSC/D878511-VOL-2)
AVAILABILITY SOURCE
Avail: NTIS HC A10/MF A02 CSCL 20/11
COSATI CODE
This is the third set of five volumes which describe the software architecture for the Computational Structural Mechanics Testbed. Derived from NICE, an integrated software system developed at Lockheed Palo Alto Research Laboratory, the architecture is composed of the command language CLAMP, the command language interpreter CLIP, and the data manager GAL. Volumes 1, 2, and 3 (NASA CR's 178384, 178385, and 178386, respectively) describe CLAMP and CLIP and the CLIP-processor interface. Volumes 4 and 5 (NASA CR's 178387 and 178388, respectively) describe GAL and its low-level I/O. CLAMP, an acronym for Command Language for Applied Mechanics Processors, is designed to control the flow of execution of processors written for NICE. Volume 3 describes the CLIP-Processor interface and related topics. It is intended only for processor developers.
Author

TYPICAL JOURNAL ARTICLE CITATION AND ABSTRACT


ACCESSION NUMBER
A84-45547* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
TITLE
THE FUNCTION OF REPORT COMPONENTS IN THE SCREENING AND READING OF TECHNICAL REPORTS
AUTHORS
T. E. PINELLI, V. M. CORDLE (NASA, Langley Research Center, Hampton, VA), and R. F. VONDRAN (Catholic University of America, Washington, DC) Journal of Technical Writing and Communication (ISSN 0047-2816), vol. 14, no. 2, 1984, p. 87-94. refs
AUTHORS' AFFILIATION
JOURNAL TITLE
PUBLICATION DATE
Copyright
A reader preference survey of engineers and scientists at the NASA Langley Research Center and in three professional/technical societies was conducted to determine the opinions of report users and producers concerning the format (organization) of NASA technical reports and the usage of technical report components. The survey questionnaire contained fourteen questions covering twelve survey topics. This article reports the findings of two survey topics: the components initially reviewed or read to determine whether to read a report in its entirety and the order in which report components are read.
Author

INFORMATION RESOURCES MANAGEMENT 1984-1989

A Bibliography with Indexes

MAY 1990

IRM ACTIVITIES AND PLANNING

Initiated under the Paperwork Reduction Act of 1980, IRM has focused, formalized, and provided infrastructure for previously scattered and apparently heterogeneous activities. Various approaches evidenced in the examples in this section show a convergence on the theme that IRM can be successfully applied.

A86-21876
EASCON '84; PROCEEDINGS OF THE SEVENTEENTH ANNUAL ELECTRONICS AND AEROSPACE CONFERENCE, WASHINGTON, DC, SEPTEMBER 10-12, 1984
Conference sponsored by IEEE and DOD. New York, Institute of Electrical and Electronics Engineers, 1984, 334 p. For individual items see A86-21877 to A86-21891.
Copyright

U.S. national Command, Control, Communication (CCC) activities are discussed, taking into account the Nationwide Emergency Telecommunications System (NETS), an outlook on national CCC systems, the improvement of the national military command systems, the Air Force communications commands family of technical initiatives for information systems Air Force-wide, a game plan for the new joint tactical CCC agency, and strategic communications using ELF. Other subjects explored are related to distributed CCCI, NATO CCCI, civilian/government information systems, DOD terrestrial communications networks, DOD communication technology, emerging telecommunications policy issues, national security/emergency preparedness telecommunications, advanced high frequency communications, government and commercial space communications, and the Space Station. Attention is also given to advanced concepts in space communications, technology and policy aspects of commercial satellite communications, commercial space applications, information systems, technology transfer, and space systems. G.R.

A86-34194
GUIDANCE, NAVIGATION, AND CONTROL FOR 21ST CENTURY AIRCRAFT
J. H. BRAHNEY Aerospace Engineering (ISSN 0736-2536), vol. 6, April 1986, p. 18-24.
Copyright

Developments such as optical fault-tolerant buses, full digital fly-by-wire control, and active flutter suppression for military aircraft with stores, will make possible ultra fault-tolerant, reliable, high-integrity flight control systems and avionics architectures for the next generation civil and military aircraft. Multiple-redundant automatic flight control systems (AFCS) will enable maximum airframe and engine element performance by relaxing many traditional stability and control constraints. Local flow or vortex control over all lifting surfaces and parts of the fuselage, and integration of highly interactive subsystems like vectored thrust, will improve cruise performance, short field capability, and maneuverability. Other innovations foreseen include automated situational information management systems, the application of artificial intelligence, and local pressure, vibration, surface conditions, and deflection measurement sensors. R.R.

A87-11807#
FANS - A U.S. PERSPECTIVE
S. B. PORITZKY (FAA, Washington, DC) IN: Radio Technical Commission for Aeronautics, Annual Assembly Meeting and Technical Symposium, Washington, DC, November 19-21, 1985, Proceedings. Washington, DC, Radio Technical Commission for Aeronautics, 1985, p. 133-144.

The ICAO Future Air Navigation System (FANS) Committee was established to identify potential systems and techniques for improving communications, navigation and surveillance systems and to lay the groundwork for international standardization of the systems. Acceptance of a new system hinges on the perceived need and the willingness (and ability) to pay for it. The latter factor has been a constraining force in numerous developing areas of the world. Studies of the benefits of satellite-based navigation systems led to the identification of several areas in which international civil aviation can benefit from satellites: better position and altitude resolution in the 290-1000 ft altitude interval, improved data link communications, and improved performance standards and an airborne separation ensurance capability. The logistics which would have to be implemented to realize these goals with an internationally accepted standard satellite navigation system are discussed. M.S.K.

A87-16003#
THE CONSULTATIVE COMMITTEE FOR SPACE DATA SYSTEMS (CCSDS) PLANNED AND POTENTIAL USE OF THE RECOMMENDATIONS
H. KUMMER (ESA, European Space Operations Centre, Darmstadt, West Germany) IAF, International Astronautical Congress, 37th, Innsbruck, Austria, Oct. 4-11, 1986. 8 p. refs
(IAF PAPER 86-303)

The CCSDS has, with the participation of most of the world's major space agencies, established a number of important recommendations for space data system standards. The activities cover: (1) radiometric, i.e., tracking and flight dynamics data, (2) standard format data units for data transfer, archiving and retrieval and (3) data structures and operation procedures for telemetry, command, timing and radio frequency systems. The paper covers the progress of work in this last group of topics and in particular, the acceptance and application of the recommendations in the planning of the infrastructure and projects of the CCSDS participating agencies. One outstanding example in this context is the U.S. Space Station with Canadian, European and Japanese participation, all four also supporting CCSDS activities. Author

A87-31113#
ISSUES AND THEMES IN INFORMATION SCIENCE AND TECHNOLOGY
SAUL AMAREL (DARPA, Information Science and Technology Office, Arlington, VA) AIAA, NASA, and USAF, Symposium on Automation, Robotics and Advanced Computing for the National Space Program, 2nd, Arlington, VA, Mar. 9-11, 1987. 3 p.
(AIAA PAPER 87-1661) Copyright

The VLSIC and networking technologies and the goals of current research by DARPA are discussed. Multiprocessor architectures have been devised which are potentially useful for vision, speech, complex symbolic processing and large scientific problems, provided appropriate computational paradigms are developed which exploit the parallel processing architectures. AI development efforts

are being directed at producing systems which can solve real-life problems, with basic research still being performed on representation, reasoning, learning and discovery, and on frameworks for designing and implementing AI systems, particularly software development systems. Efforts are being expended to expand the ARPANET computer network to enhance collaborative research and engineering productivity. The CAD techniques developed to define the VLSICs have industrial applications for mechanical parts and processes. Advanced robotic projects include work on an autonomous land rover. Finally, expanded R&D on teaching and training systems and on adaptive man-machine interfaces are recommended. M.S.K.

A87-48590#
DATA MANAGEMENT STANDARDS FOR SPACE INFORMATION SYSTEMS
R. DES JARDINS (Computer Technology Associates, Inc., McLean, VA) and C. MAZZA (ESA, European Space Operations Centre, Darmstadt, West Germany) AIAA and NASA, International Symposium on Space Information Systems in the Space Station Era, Washington, DC, June 22, 23, 1987. 7 p.
(AIAA PAPER 87-2205) Copyright

Data management - that is, storing, describing and retrieving data - is a special problem for the high performance bit-efficient information systems required for space missions. This paper presents a summary description of data management for space information systems, and describes four specific problem areas that can benefit from data management standards in the Space Station era: data description, data capture, data interchange, and data interpretation. In each area, a recommended modern data management standard or related technique is described as an example recommendation for future space information systems. The paper concludes with a recommendation that space agencies develop testbed validations of these 'new' approaches to data management. Author

A87-53087
FUTURE INFORMATION TECHNOLOGY - THE BIG PICTURE
EDITH W. MARTIN (Boeing Electronics Co., Seattle, WA) IN: The human quest in space; Proceedings of the Twenty-fourth Goddard Memorial Symposium, Greenbelt, MD, Mar. 20, 21, 1986. San Diego, CA, Univelt, Inc., 1987, p. 145-153; Discussion, p. 154, 155.
(AAS PAPER 86-111) Copyright

Future trends in the computer industry are considered. The social and economic changes related to the use of computers are discussed. The advances in component and architecture technology for computer hardware and software are described. It is suggested that there is a need for improvements in computer software, in particular for software capable of system integration. I.F.

A88-10402
CHARACTERISTICS OF R&D MANAGEMENT WHICH INFLUENCE INFORMATION NEEDS
ROBERT G. BATSON (Alabama, University, Tuscaloosa) IEEE Transactions on Engineering Management (ISSN 0018-9391), vol. EM-34, Aug. 1987, p. 178-183. refs
Copyright

The information needs of mid- and upper-level R&D managers are identified by reviewing their environment, functions, and communication patterns from an information systems perspective. The information problems in R&D, such as inability to respond rapidly and failure of analytical support methods, are seen as symptoms of the mismatch of information needs and the information systems employed. The new technology of decision support systems is discussed as the ideal solution approach to R&D information management and decision-making. A comprehensive list of candidate data bases is provided. Author

A88-52359
INFORMATION SYSTEMS FOR SHUTTLE PROCESSING - AN ENTERPRISE APPROACH
MARK W. EDSON and JAMES E. SHOWALTER IN: Space Congress, 25th, Cocoa Beach, FL, Apr. 26-29, 1988, Proceedings. Cape Canaveral, FL, Canaveral Council of Technical Societies, 1988, p. 9-95 to 9-106.
Copyright

The purpose of this paper is to describe a process being utilized by Lockheed Space Operations Company (LSOC) for planning, developing and supporting an integrated information system for the Shuttle Processing Contract (SPC). This process was developed by Electronic Data Systems (EDS) to address the complex modernization and integration issues facing General Motors (GM). LSOC has contracted EDS to participate in adapting the process to the environment at Kennedy Space Center (KSC) for shuttle processing. Author

A89-12104*# National Aeronautics and Space Administration, Washington, DC.
MAINTAINING OUTER SPACE FOR PEACEFUL PURPOSES THROUGH INTERNATIONAL COOPERATION
GEORGE E. REESE, DAVID J. THACHER (NASA, Washington, DC), and HELEN S. KUPPERMAN IN: Colloquium on the Law of Outer Space, 30th, Brighton, England, Oct. 10-17, 1987, Proceedings. Washington, DC, American Institute of Aeronautics and Astronautics, 1988, p. 52-55. refs
Copyright

NASA activities in support of international cooperation in space exploration and exploitation are briefly reviewed, with a focus on their compatibility with UN treaties. Particular attention is given to the provisions of the National Aeronautics and Space Act of 1958 and other applicable legislation, the over 1000 bilateral and international agreements NASA has entered into since 1958, international participation in currently ongoing NASA projects (Hubble Space Telescope, Galileo, Ulysses, Rosat, the D-2 Spacelab mission), and plans for the International Space Station. T.K.

A89-12107#
MAN-MADE SPACE DEBRIS - DATA NEEDED FOR RATIONAL DECISION
STEPHEN GOROVE (Mississippi, University, University; International Institute of Space Law, Paris, France) IN: Colloquium on the Law of Outer Space, 30th, Brighton, England, Oct. 10-17, 1987, Proceedings. Washington, DC, American Institute of Aeronautics and Astronautics, 1988, p. 135-137. refs
Copyright

This article starts with an emphasis on the growing risks arising from man-made space debris. It calls for a comprehensive study and review of essential data required for informed decision. The data relates not only to the various types of debris but also to the damage that each category of debris may cause and the likelihood of the latter's occurrence. The study and continuous assessment of the debris situation may be undertaken by an appropriate body of scientists, engineers and other professionals under UN auspices. Author

A89-17630*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
TELESCIENCE, AN OPERATIONAL APPROACH TO SCIENCE INVESTIGATION
JAMES R. WEISS (California Institute of Technology, Jet Propulsion Laboratory, Pasadena) IAF, International Astronautical Congress, 39th, Bangalore, India, Oct. 8-15, 1988. 11 p.
(IAF PAPER 88-011)

The NASA Science and Applications Information System, which is based on telescience and must provide remote interaction between information system services in space and on the ground, is discussed. An infrastructure of networked facilities and institutionally provided support services is being developed. The technologies involved with providing telescience capability are examined, including automated data management services, new data acquisition systems, user support environment for system access, and the capability to access heterogeneous data bases and computational facilities from remote locations. R.B.

A89-18148#
COMMON SENSE AND PRACTICAL EXPERIENCE PRIOR TO 2167
JAMES E. POAG IN: AIAA/IEEE Digital Avionics Systems Conference, 8th, San Jose, CA, Oct. 17-20, 1988, Technical Papers. Part 2. Washington, DC, American Institute of Aeronautics and Astronautics, 1988, p. 654-658. refs
(AIAA PAPER 88-3990) Copyright

The DoD-STD-2167 is rapidly becoming the standard of software development for defense contracts. In this paper, company business practices affected by DoD-STD-2167 are considered. The resulting need for external expertise and fiscal constraints and doubts are examined. Problems with internal politics and proposal management problems due to DoD-STD-2167 are addressed. C.D.

A89-27210* California Univ., Berkeley.
ASTRONOMICAL DATA ANALYSIS FROM REMOTE SITES
SUPRIYA CHAKRABARTI, CARL DOBSON, GEORGE KAPLAN, HERMAN MARSHALL, MICHAEL LAMPTON (California, University, Berkeley) et al. IN: Astronomy from large databases: Scientific objectives and methodological approaches; Proceedings of the Conference, Garching, Federal Republic of Germany, Oct. 12-14, 1987. Garching, Federal Republic of Germany, European Southern Observatory, 1988, p. 295-303. Research supported by the University Space Research Association.
(Contract NAS5-29298; NASW-4234)
Copyright

The development of telescience methodologies for teledesign, teleoperation, and teleanalysis, and the possible verification of these concepts using the Extreme UV Explorer (EUVE) are discussed. The EUVE is a satellite payload scheduled for launch in 1991. The use of the Browse data base system (Star et al., 1987) is reviewed and its suitability for astronomy applications is evaluated. The possibility of adopting the Browse system for EUVE data analysis is considered. R.B.

A89-41654
U.S. GOVERNMENT POLICIES AND HYPERSONIC FLIGHT IN THE 21ST CENTURY
THOMAS R. GOLDBERG (Radian Corp., Herndon, VA) IEEE Aerospace and Electronic Systems Magazine (ISSN 0885-8985), vol. 4, May 1989, p. 26-31. refs
Copyright

The author examines the potentially negative impact of the U.S. regulations on the development of advanced materials, components, and systems. High priority is given to modification of US antitrust laws if the U.S. is to have the best possible opportunity to compete with more aggressive economies abroad. Export controls are identified as limiting the availability of data to U.S. firms engaged in developing commercial applications. It is asserted that policies must also be enacted to better protect intellectual property rights. I.E.

N84-11989# Committee on Government Operations (U.S. House).
PAPERWORK REDUCTION ACT AMENDMENTS OF 1983
Washington GPO 1983 40 p Presented to the Comm. of the Whole House on the State of the Union, 98th Congr., 1st Sess., 1983
(H-REPT-98-147; GPO-20-580) Avail: US Capitol, House Document Room

A requirement of section 3504 of title 44 of the United States Code requires the OMB Director to appoint a trained and professionally experienced Chief Statistician to be responsible for the statistical policy and coordination functions previously assigned to the Director. In addition to being charged with fulfilling previously mandated responsibilities, the Chief Statistician is also required to integrate the statistical functions with other information resources management functions performed by the Administration of the Office of Information and Regulatory Affairs within the OMB. A.R.H.

N84-18304*# Grumman Aerospace Corp., Bethpage, NY.
SPACE STATION NEEDS, ATTRIBUTES AND ARCHITECTURAL OPTIONS, VOLUME 2, BOOK 3: COST AND PROGRAMMATICS Final Technical Report
20 Apr. 1983 79 p refs
(Contract NASW-3685)
(NASA-CR-173320; NAS 1.26:173320; SA-SSP-RP008-VOL-2-BK-3) Avail: NTIS HC A05/MF A01 CSCL 22/2

The cost and programmatic considerations which integrate mission requirements and architectural options into a cohesive system for exploitation of space opportunities within affordable limits are discussed. The mission requirements, baseline architecture, a top level baseline schedule, and acquisition costs are summarized. The work breakdown structure (WBS) used to structure the program, and the WBS dictionary are included. The costing approach used, including the operation of the primary costing tool, the SPACE cost model are described. The rationale for the choice of cost estimating relationships is given and costs at the module level are shown. Detailed costs at the subsystem level are shown. The baseline schedule and annual funding profiles are provided. Alternate schedules are developed to provide different funding profiles. Alternate funding sources are discussed and foreign and contractor participation is outlined. The results of the benefit analysis are given and the accrued benefits deriving from an implemented space station program are outlined. A.R.H.

N84-19169# Alpha Omega Group, Inc., Harvard, MA.
FUNCTIONAL AND DATABASE ARCHITECTURE DESIGN
26 Sep. 1983 18 p
(Contract N00014-83-C-0525)
(AD-A136275) Avail: NTIS HC A03/MF A01 CSCL 05/2

Much attention and considerable effort has been focused recently on the collection and storage of descriptions of an organization's data and information resources. Some organizations have been quite successful in this collection and storage effort. A different problem, which is more difficult to deal with, has been to provide an easy, effective mechanism for users to access this information once it is stored. This problem generally reduces to determining the existence of information. The Locator and Classifier for Universe Standardization (LOCUS) is a concept which seeks to provide a tool which will aid the user in determining the existence and location of the information about data' (i.e., metadata) which is required to perform some task. It is important to emphasize here that LOCUS is a system which operates on metadata, not data itself. GRA

N84-21408*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.
INTERCENTER PROBLEM REPORTING AND CORRECTIVE ACTION SYSTEM (PRACAS)
G. H. BROCK and J. J. PALEY *In* NASA. Kennedy Space Center NASA Admin. Data Base Management Systems, 1983 p 31-54 Apr. 1984 refs Prepared in cooperation with Computer Sciences Corp., Orlando, Fla.
Avail: NTIS HC A08/MF A01 CSCL 05/2

The Kennedy Space Center is transforming the PRACA bath automatic data processing (ADP) system of today into a fully integrated data base with on-line update and retrieval capabilities. The present manual system of reporting (Datafax, mail, and telephone) to the off-site design and engineering organizations is to be replaced by direct access to the most current information as it accrues at KSC or VAFB. Two major goals of the Intercenter PRACA are to provide a single data depository for both launch sites and to fully integrate the problem data with engineering data as well as other relevant information. The resulting ADP system can provide a closed loop system for problem reporting, corrective action and recurrence control that should serve the engineering community as well as reliability and quality assurance at the launch sites, KSC and VAFB, and at the design centers, JSC and MSFC. A.R.H.

N84-21429# Office of the Secretary of Defense, Washington, DC. Plans and Resources Div.
WORD PROCESSORS IN AEROSPACE/DEFENSE INFORMATION SERVICES: USE OF DISTRIBUTED INFORMATION SYSTEMS BY THE OFFICE OF THE SECRETARY OF DEFENSE
J. M. POWERS *In* AGARD The Appl. of New Technol. to Improve the Delivery of Aerospace and Defence Inform. 5 p Dec. 1983
Copyright Avail: NTIS HC A06/MF A01

The utilization of word processing and distributed information systems within the Office of the Secretary of Defense (OSD) are described. The OSD is the principal management staff of the Secretary in the exercise of: policy definition, planning, resource management, program evaluation, and fiscal evaluation. Thus, there are in fact certain general management functions that agree common to both OSD and to many civilian industrial organizations. The real common denominator in the management of both military and industrial programs, however, is information - information that is accurate, up-to-date, specific, yet comprehensive - information that is needed to assess and evaluate programs and to make better, more informed decisions. Author

N84-22316*# Missouri Univ., Rolla.
THE DATABASE MANAGEMENT SYSTEM: A TOPIC AND A TOOL
O. R. PLUMMER *In* NASA. Langley Research Center IPAD 2: p 229-235 Apr. 1984
Avail: NTIS HC A12/MF A02 CSCL 09/2

Data structures and data base management systems are common tools employed to deal with the administrative information of a university. An understanding of these topics is needed by a much wider audience, ranging from those interested in computer aided design and manufacturing to those using microcomputers. These tools are becoming increasingly valuable to academic programs as they develop comprehensive computer support systems. The wide use of these tools relies upon the relational data model as a foundation. Experience with the use of the IPAD RIM5.0 program is described. E.A.K.

N84-23297# Air Force Systems Command, Wright-Patterson AFB, OH.
MECHANIZED CONTRACT DOCUMENT PREPARATION AND ABSTRACT SYSTEM Final Report
T. L. BONO *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 18-22 1983
(AD-P002750) Avail: NTIS HC A24/MF A04 CSCL 15/5

We have developed a system that revolutionizes contract document preparation by taking advantage of state-of-the-art technology in combining the functions of word processing (WP) and data processing (DP). This system has been proven effective in reducing document preparation time, in producing a better quality document, and reducing document errors. The system simultaneously captures data to be abstracted and fed into a Management Information System (MIS) ensuring that the contract document and abstracted data in the MIS are identical. Since contract documents are mostly text, the WP capability was most important, yet the abstract of specific information could not be accurately and efficiently captured in WP mode. To streamline the data capture portion of the system for abstracting, DP was needed. Finally, to produce a finished product containing both the text and abstracted data, WP and DP had to be efficiently integrated. Through complex software development, we supplemented the vendor software development, we supplemented the vendor software to build a successful prototype system that is undergoing acceptance testing. The system is still in its infancy, but it has taken great strides in increasing the efficiency of contractual document preparation and abstracting. Yet to come is distributed processing of edit and validation routines currently being accomplished on the mainframe computer. Author (GRA)

N84-23402# Rome Air Development Center, Griffiss AFB, NY.
BEYOND THE DATA BASE: TECHNOLOGY FOR INFORMATION RESOURCE MANAGEMENT
P. M. LANGENDORF Dec. 1983 43 p
(Contract AF PROJ. 4594)
(AD-A138840; RADC-TR-83-312) Avail: NTIS HC A03/MF A01 CSCL 09/2

This report is about data in our society. It first discusses values, how people feel about using data. It then discusses how man has used the technology that is available as tools in handling data, and how data handling has changed as technology changes. Information resource management is now changing very rapidly as new technology becomes available. The report argues that the complex programs we call data base management systems (DBMS) are an artifact of monolithic computers with hierarchies of secondary storage managed by complex general purpose operating systems. The next step will take the DBMS apart, distributing the data management functions to provide the same capabilities with less constraints. The report concludes with a discussion of theory regarding computer based data management. It covers the intellectual ferment following the introduction of random access secondary storage, the development of CODASYL, and the relational model. It briefly discusses the familiar arguments regarding the need to separate logical data definition from the physical location of data, stressing different representational requirements. The report concludes with the author's view of what is needed to form an adequate foundation for information resource management system development. Author (GRA)

N84-24244# Ultracom, Inc., Del Mar, CA.
DEVELOPMENT OF A PROPOSED STANDARD FOR THE EXCHANGE OF SCIENTIFIC MICROCOMPUTER PROGRAMS Summary Report
J. M. FISCELLA Nov. 1983 16 p
(PB84-157940; ULT-2002) Avail: NTIS HC A03/MF A01 CSCL 09/2

The incompatibility problems encountered between different microcomputer and supermicrocomputer systems for the exchange of software are reviewed. It examines the causes of exchange incompatibility for some of the most widely used hardware and operating systems, with the aim of specifing a set of exchange standards. More than one standards set is required because of the diversity of operating systems and mass storage formats. The exchange standard developed include specifications of what types of files are to be included on the mass storage exchange medium, as well as a full description of the mass storage format (including medium, density, operating system, etc.). Three different exchange standard sets are recommended, all utilizing diskettes. Author

N84-24504# Committee on Small Business (U.S. House).
PAPERWORK REDUCTION ACT OF 1980
Washington GPO 1984 160 p Hearing before the Subcomm. on Govt. Regulation and Paperwork of the Comm. on Small Business, 98th Congr., 1st Sess., 15 Nov. 1983
(S-REPT-98-479; GPO-28-416) Avail: Subcommittee on Government Regulation and Paperwork

How Government paperwork requirements are affecting America's small businesses is examined with emphasis on the effectiveness of the 1980 Paperwork Reduction Act, Public Law 96-511. Some specific recommendations as to how the paperwork burden can be further reduced are advanced. A.R.H.

N84-25528# Committee on Armed Services (U.S. House).
TECHNOLOGY TRANSFER
Washington GPO 1984 297 p refs Hearings before the Technol. Transfer Panel of the Comm. on Armed Services, 98th Congr., 1st Sess., 9, 21, 23 Jun.; 13-14 Jul. 1983
(H-REPT-98-15; GPO-27-827) Avail: Committee on Armed Services

The problem of unequal technology transfer between the United States and the U.S.S.R. is discussed with particular emphasis on the National Security of the United States and the economic impact of the information flow. Trade control lists such as the Militarily

Critical Technology List (MCTL) are examined and associated trade control strategies are discussed. Specific industries such as the computer and semiconductor equipment industries are examined. M.A.C.

N84-25742# Range Commanders Council, White Sands Missile Range, NM. Documentation Group.
UNIVERSAL DOCUMENTATION SYSTEM HANDBOOK - AN INTRODUCTION TO THE UNIVERSAL DOCUMENTATION SYSTEM
1984 16 p
(AD-A140140; RCC/DG-501-84) Avail: NTIS HC A03/MF A01 CSCL 05/1

The Range Commanders Council (RCC) Documentation Group has developed a Universal Documentation System (UDS) for the purpose of creating better communications between interacting agencies. The UDS endeavors to standardize the efforts of all agencies who seek support in conducting operations on the various ranges. The following graphic illustrations have been prepared for the purpose of familiarizing potential range users with the UDS, which has been published as RCC Document 401. An overview of the system, including descriptions of the various levels of documentation, system flexibility/options and general user guidelines has been included. The UDS is a comprehensive tool which can be used by all. Author (GRA)

N84-29437# Arizona Univ., Tucson. Coll. of Business and Public Administration.
INFORMATION SEARCH IN JUDGMENT TASKS: THE EFFECTS OF UNEQUAL CUE VALIDITY AND COST Interim Technical Report
T. CONNOLLY and P. SERRE May 1984 31 p
(Contract N00014-83-K-0742)
(AD-A141712; ONR-84-1) Avail: NTIS HC A03/MF A01 CSCL 05/1

The broad question addressed by this research is: How good are humans at balancing the costs and benefits of their information acquisition? Do they buy those, and only those, sources of information whose acquisition cost is outweighed by the improvement in decision quality that their use makes possible? The evidence reported here, together with that reviewed earlier, suggests that the answer is not encouraging. Specifically, the present findings extend those noted earlier in suggesting: (1) That the pattern of overpurchase for low-consequence decisions, and underpurchase for high-consequence decisions, is robust to variation in overall cue validity, as well as to procedural modifications such as manual versus computer-interactive transactions (Experiment 1), (2) That overpurchase is frequently coupled with mispurchase (Experiments 2 & 3). That is, subjects, in addition to buying overall more information than was normatively justified, frequently bought expensive cues when cheap, equally-valid ones were available (Experiment 2), or low-validity cues when higher-validity, equally-costly cues were available (Experiment 3), (3) That subjects perceive equally-valid cues as of differential validity (Experiments 1 & 2), and are able to detect real validity differences between cues reliably only when the differences are large (Experiment 3). Purchase behavior is generally shaped by these perceptions of validity, whether well-founded or not, though the relationship disappears when equally-valid cues are offered at different costs (Experiment 2). GRA

N84-31060# National Telecommunications and Information Administration, Washington, DC.
POLICY IMPLICATIONS OF INFORMATION TECHNOLOGY
R. K. SALAMAN and E. C. HETTINGER Feb. 1984 50 p refs
(PB84-183219; NTIA-84-144) Avail: NTIS HC A03/MF A01 CSCL 05/2

Three-quarters of the U.S. employment and one-half of the Gross National Product (GNP) are associated with services. In 1981, services employment predominated, for the first time, over both agriculture and manufacturing, even in the Third World countries. The increasing importance of services to the economy and the society has been stimulated by the greater availability of information and communications products. A project devoted to formulation of national information policy as necessary to accommodate the new opportunities presented by advanced information technologies, and the impact on the economy and society is analyzed. The meaning of information policy is defined, the report and current issues concerning domestic industry, growth, maintaining international leadership, and new considerations regarding intellectual property are discussed. GRA

N84-32282*# Towson State Univ., MD. Dept. of Computer and Information Sciences.
LOGICAL OPTIMIZATION FOR DATABASE UNIFORMIZATION Technical Report, 1 Sep. 1983 - 31 Aug. 1984
J. GRANT 1984 98 p refs
(Contract NAG5-267)
(NASA-CR-173836; NAS 1.26:173836) Avail: NTIS HC A05/MF A01 CSCL 05/2

Data base uniformization refers to the building of a common user interface facility to support uniform access to any or all of a collection of distributed heterogeneous data bases. Such a system should enable a user, situated anywhere along a set of distributed data bases, to access all of the information in the data bases without having to learn the various data manipulation languages. Furthermore, such a system should leave intact the component data bases, and in particular, their already existing software. A survey of various aspects of the data bases uniformization problem and a proposed solution are presented. Author

N84-33267*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
STRATEGIES FOR CONVERTING TO A DBMS ENVIRONMENT
D. M. DURBAN *In* NASA, Washington NASA Admin. Data Base Management Systems, 1984 p 1-10 Sep. 1984
Avail: NTIS HC A07/MF A01 CSCL 05/2

The conversion to data base management systems processing techniques consists of three different strategies - one for each of the major stages in the development process. Each strategy was chosen for its approach in bringing about a smooth evolutionary type transition from one mode of operation to the next. The initial strategy of the indoctrination stage consisted of: (1) providing maximum access to current administrative data as soon as possible; (2) select and developing small prototype systems; (3) establishing a user information center as a central focal point for user training and assistance; and (4) developing a training program for programmers, management and ad hoc users in DBMS application and utilization. Security, the rate of the data dictionary, and data base tuning and capacity planning, and the development of a change of attitude in an automated office are issues meriting consideration. A.R.H.

N84-33268*# National Aeronautics and Space Administration, Washington, DC.
EFFECTIVE ORGANIZATIONAL SOLUTIONS FOR IMPLEMENTATION OF DBMS SOFTWARE PACKAGES
D. JONES *In its* NASA Admin. Data Base Management Systems, 1984 p 11-20 Sep. 1984
Avail: NTIS HC A07/MF A01 CSCL 05/2

The space telescope management information system development effort is a guideline for discussing effective organizational solutions used in implementing DBMS software. Focus is on the importance of strategic planning. The value of constructing an information system architecture to conform to the organization's managerial needs, the need for a senior decision maker, dealing with shifting user requirements, and the establishment of a reliable working relationship with the DBMS vendor are examined. Requirements for a schedule to demonstrate progress against a defined timeline and the importance of continued monitoring for production software control, production data control, and software enhancements are also discussed. A.R.H.

N84-33271*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
A USER VIEW OF OFFICE AUTOMATION OR THE INTEGRATED WORKSTATION
E. R. SCHMERLING *In* NASA, Washington NASA Admin. Data Base Management Systems, 1984 p 51-54 Sep. 1984
Avail: NTIS HC A07/MF A01 CSCL 05/2

Central data bases are useful only if they are kept up to date and easily accessible in an interactive (query) mode rather than in monthly reports that may be out of date and must be searched by hand. The concepts of automatic data capture, data base management and query languages require good communications and readily available work stations to be useful. The minimal necessary work station is a personal computer which can be an important office tool if connected into other office machines and properly integrated into an office system. It has a great deal of flexibility and can often be tailored to suit the tastes, work habits and requirements of the user. Unlike dumb terminals, there is less tendency to saturate a central computer, since its free standing capabilities are available after down loading a selection of data. The PC also permits the sharing of many other facilities, like larger computing power, sophisticated graphics programs, laser printers and communications. It can provide rapid access to common data bases able to provide more up to date information than printed reports. Portable computers can access the same familiar office facilities from anywhere in the world where a telephone connection can be made. A.R.H.

N84-33273*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
STRIP AND LOAD DATA
R. H. JONES *In* NASA, Washington NASA Admin. Data Base Management Systems, 1984 p 57-58 Sep. 1984
Avail: NTIS HC A07/MF A01 CSCL 05/2

The method of taking batch data files and loading these files into the ADABAS data base management system (DBMS) is examined. This strip and load process allows the user to quickly become productive. Techniques for data fields and files definition are also included. M.A.C.

N84-33284# RAND Corp., Santa Monica, CA.
INTERACTIVE INFORMATION ENVIRONMENTS: A PLAN FOR ENABLING INTERDISCIPLINARY RESEARCH
L. R. TALBERT, T. K. BIKSON, and N. Z. SHAPIRO Apr. 1984 76 p refs
(RAND/N-2115) Avail: NTIS HC A05/MF A01

The implementation of information technology in organizational settings is examined. Research plans and problems are discussed along with the preliminary procedures and hypotheses. An organizational structure is also provided. M.A.C.

N84-33288# Air Command and Staff Coll., Maxwell AFB, AL.
IMPLEMENTING AUTOMATED INFORMATION SYSTEMS IN THE AIR FORCE
J. P. TOTSCH Apr. 1984 34 p
(AD-A143398; ACSC-84-2605) Avail: NTIS HC A03/MF A01 CSCL 09/2

The report purpose is to review and evaluate Air Force guidance on implementing information systems and to provide step-by-step procedures on how to implement such systems. It presents the step-by-step procedures one must follow to initiate, plan, organize, implement, and maintain an automated information system. The project also evaluates Air Force guidance on implementing these systems from a user's perspective and recommends actions to ease the burden on the system implementer. GRA

N84-33296# National Library of Medicine, Bethesda, MD. Technical Services Div.
NOTES FOR MEDICAL CATALOGERS, 1983
May 1984 35 p refs
(PB84-195874; NLM-TSD-84-01) Avail: NTIS HC A03/MF A01 CSCL 05/2

The report contains articles and news announcements describing the cataloging policies, procedures and bibliographic databases of the Cataloging Section of the National Library of Medicine. GRA

N84-34188# Oak Ridge National Lab., TN. Computer Sciences.
USER'S GUIDE FOR AN IBM PL/I IMPLEMENTATION OF THE INTERNATIONAL STANDARD ORGANIZATION DIS 8211 INFORMATION PROCESSING-SPECIFICATION FOR A DATA DESCRIPTIVE FILE FOR INFORMATION INTERCHANGE
A. A. BROOKS, F. D. HAMMERLING, and B. N. MCNEELY Oct. 1983 59 p refs
(Contract W-7405-ENG-26)
(ORNL/CSD-TM-207) Avail: NTIS HC A04/MF A01

An IBM PL/I implementation of the International Standard Organization DIS 8211 Information Processing - Specification for a Data Descriptive File for Information Interchange is described. This implementation is in the form of user callable, multiple entry PL/I subprograms that perform the functions necessary for the creation of and retrieval from these files. Two typical main procedures are included which make use of the general purpose subroutines. The first is a main procedure which creates the Data Descriptive File and which calls input routines to obtain the required input data. Two of these input routines are described. The second main procedure provides for the retrieval of records and fields from an existing Data Descriptive File and produces output lists of the data and field controls. M.A.C.

N84-34327# Defense Technical Information Center, Alexandria, VA.
DTIC 2000: A CORPORATE PLAN FOR THE FUTURE Final Report
R. D. DOUGLAS, E. V. MCCAULEY, A. D. KUHN, J. L. BELL, and K. W. WOOLRIDGE Jul. 1984 115 p Original contains color illustrations
(AD-A143900; DTIC/TR-84/3) Avail: NTIS HC A06/MF A01 CSCL 05/2

This report documents the corporate level long-range plan for the Defense Technical Information Center (DTIC). The plan describes the societal and DoD environments within which DTIC will most likely operate over the next 15-20 years. It relates these future environments to meaningful long-range goals for DTIC. The particular areas highlighted in the plan are Products and Services; Personnel; and Finance and Budget. Author (GRA)

N85-10859# Naval Postgraduate School, Monterey, CA.
DATA DICTIONARY SYSTEMS AND THEIR ROLE IN INFORMATION RESOURCE MANAGEMENT M.S. Thesis
D. L. ROBERTSON Mar. 1984 93 p
(AD-A144905) Avail: NTIS HC A05/MF A01 CSCL 09/2

The explosive proliferation of computers has led to the increasing importance of developing and implementing various management concepts for effective and efficient operation and control. The complex data processing environment of today cannot be handled by hardware alone, but require an information system composed of hardware, software, data, personnel and procedures. The vast storage capabilities of modern equipment had led to the development of databases for more effective and efficient use of memory capacity. The increasing importance of software and the cost of developing and maintaining it demands more and better management, giving rise to the software life cycle concept. With the automation of the functions of an organization, data and information become critical organizational resources. Information Resource Management provides effective and efficient management and control of these information resources. A key component in this management and control is the Data Dictionary System. Author (GRA)

N85-12796# Interior Dept., Washington, DC.
IRM (INFORMATION RESOURCES MANAGEMENT) LONG-RANGE PLAN: FISCAL YEAR 1984-1988 (UPDATE). VOLUME 2: ADP AND TELECOMMUNICATIONS ACQUISITION PLAN

May 1984 51 p
(PB84-229244) Avail: NTIS HC A04/MF A01 CSCL 05/2

The IRM LRP provide guidance for improving management of the Interior Department's information resources. Data processing and telecommunications equipment acquisitions are discussed. The types of technology, services, and facility management are detailed. The budget formulation process is reviewed. E.R.

N85-12803# International Trade Administration, Washington, DC.
COMPETITIVE ASSESSMENT OF THE US INFORMATION SERVICES INDUSTRY Final Report
May 1984 77 p refs
(PB84-174804) Avail: NTIS HC A05/MF A01 CSCL 05/2

An operational definition of the four principal segments of the information services industry in the United States: database development, on-line information services, document supply services, and customized search and abstracting services are discussed. Major domestic firms are identified along with a discussion of the current state of information services in Europe and Japan. Domestic markets and firms are discussed in terms of their characteristics and trends. Domestic and international competitive issues are identified. Return on investment is calculated for hypothetical data base development and on-line services projects, along with an analysis of the sensitivity of internal rate of return to changes in the most significant factors. Driving forces in the future of the industry are identified. A limited number of international and domestic options for maintaining the competitiveness of the domestic industry are discussed. Author

N85-13673# Brigham Young Univ., Provo, UT. Dept. of Economics.
ECONOMIC VALUE OF CONSUMER INFORMATION: A SELECTED, ANNOTATED BIBLIOGRAPHY
R. D. POPE Jul. 1984 154 p Sponsored by Economic Research Service
(PB84-235795; AGES-840312) Avail: NTIS HC A08/MF A01 CSCL 05/2

This annotated bibliography contains references on the economic value of information. The citations are listed under three topic areas: consumer surplus and welfare theory, stabilization and economic welfare, and information and efficiency. With a few exceptions, books and lengthy reports are not annotated. GRA

N85-13674# Los Alamos Scientific Lab., NM.
INFORM SYSTEM 2-YEAR PLAN, FY 1984-1985
Jul. 1984 57 p refs
(Contract W-7405-ENG-36)
(DE84-016044; LA-10185-MS) Avail: NTIS HC A04/MF A01

An implementation plan for the Information Management (INFORM) System of the Los Alamos National Laboratory for Fiscal Years 1984 and 1985 is described. Subjects discussed include system goals, planning considerations, organization, supporting facilities, projects, critical issues, and customer support. DOE

N85-15434# Argonne National Lab., IL.
RECOMMENDED DOCUMENTATION FOR COMPUTER USERS AT ANL
A. DOBYNS and R. RIVETNA Aug. 1984 69 p
(Contract W-31-109-ENG-38)
(DE84-016285; ANL/TM-379-REV) Avail: NTIS HC A04/MF A01

This is for all current and potential users of the services available from the Argonne National Laboratory computing systems. This manual guides in selecting documentation that will best fill the users needs. It describes all the documentation available at the Computing Services Division Document Distribution Center. If the documentation needed is not listed in this manual, investigate documentation that other division supply. Chapter 1 explains the use of this document. Chapter 2 is a block diagram that identifies the various topics for which documentation is available and identified their relationships to each other. Chapter 3 contains lists of publications organized by topics. Chapter 4 contains abstracts of each publication. And Chapter 5 describes additional publications that contains bibliographies and master indexes. B.R.

N85-16517# National Bureau of Standards, Washington, DC.
DOCUMENT INTERCHANGE FORMAT
J. E. KNOERDEL and S. W. SATKINS Apr. 1984 41 p Sponsored in part by Navy
(PB84-217033; NBSIR-84-2836) Avail: NTIS HC A03/MF A01 CSCL 09/2

In the absence of standards, both the private and public sectors have addressed document interchange among different vendors' text processing stems in a number of ways. In an attempt to solve this interchange problem with respect to encoding of control functions for the Department of the Navy, a project was originated by the Office of the Under Secretary of the Navy for Financial Management to determine the formation requirements of the Department of the Navy and to translate those requirements to a representation that would be supported by text processing system providers. The encoded representation of the formatting control functions is known as the Document Interchange Format (DIF). The overall approach taken by the DIF and definitions and implementation details for DIF are described. GRA

N85-17742# Naval Postgraduate School, Monterey, CA.
TOWARDS AN IDEAL DATABASE SERVER FOR OFFICE AUTOMATION ENVIRONMENTS
S. A. DEMURJIAN, D. K. HSIAO, D. S. KERR, and P. R. STRAWSER Oct. 1984 28 p
(Contract RR0-1403)
(AD-A148184; NPS52-84-018) Avail: NTIS HC A03/MF A01 CSCL 09/2

Office automation systems are growing, both in use and in complexity. The development of a database mangement system for the office automation environment becomes a high priority, in order to provide an efficient and reliable way to manage the information needs of the office. Therefore, the specification of an ideal database sever for the office automation environment becomes a key area of concern. In addition to providing traditional support, the ideal database server must also provide new database support, in order to meet the unique and many needs of office automation environments. In this paper, we focus on the characterization and specification of an ideal database server for the office automation environment. We also consider how such an ideal database server can be effectively integrated into the office automation environment. Further, we examine an experimental database system, known as the multi-backened database system (MBDS), as a candidate for the ideal database server in the office automation environment. Author (GRA)

N85-23449# Naval Postgraduate School, Monterey, CA. Dept. of Computer Science.
GENERAL DESIGN CONSIDERATIONS OF AN AIR FORCE INFORMATION SYSTEM M.S. Thesis
E. AYTACER, JR. Jun. 1984 118 p
(AD-A150611) Avail: NTIS HC A06/MF A01 CSCL 09/4

General design issues of an Air Force information system are considered in this thesis. The current structure of the system is presented with its requirements. Information storing, retrieving and updating procedures are described. An example of a logical database is designed. Networking issues are expressed in an undetailed way. Finally, a set of high-end minicomputers are evaluated to present the approximate cost of this system. And a general methodology for minicomputer selection process is presented. GRA

N85-27121# Naval Postgraduate School, Monterey, CA.
AN ANALYSIS OF DATA DICTIONARIES AND THEIR ROLE IN INFORMATION RESOURCE MANAGEMENT M.S. Thesis
S. L. LANDIN and R. L. OWENS Sep. 1984 109 p
(AD-A152134) Avail: NTIS HC A06/MF A01 CSCL 05/2

The goal of efficient management of an organization's information resource can be accomplished through the

implementation and use of a data dictionary. This thesis defines the structure and functions of a data dictionary and analyzes the attempt of the National Bureau of Standards to promulgate a standard software specification for use in the evaluation and selection of data dictionaries in the federal government. Criteria for the ideal data dictionary are developed based on the role a dictionary can play in information resource management and are then used to evaluate four commercial data dictionary packages. Finally, some ideas concerning possible applications for data dictionary technology are presented. GRA

N85-27127# Senior Interagency Group on International Communication and Information Policy, Washington, DC.
WHITE PAPER ON NEW INTERNATIONAL SATELLITE SYSTEMS
Feb. 1985 70 p
(PB85-162501) Avail: NTIS HC A04/MF A01 CSCL 17/2

Background information regarding the President's determination is reported and provides information on important regulatory and other parallel measures which are desirable to ensure that the Executive branch's fundamental policy goal, an efficient and responsive international communications environment, is achieved. The major communications and information policy issues raised by the applications before the FCC are discussed. Commercial, trade, and legal matters, and also major U.S. foreign policy interests and concerns are addressed. The report, however, consolidated much of the extensive analysis that was undertaken by the Executive branch and sets for the requirements applicable to any system that FCC may eventually authorize. GRA

N85-28633# Oak Ridge Y-12 Plant, TN.
EFFORTS AT OFFICE AUTOMATION AND INFORMATION SYSTEMS UTILIZATION AT MARTIN MARIETTA ENERGY SYSTEMS, INCORPORATED
C. A. REEVES, JR. 1 Mar. 1985 50 p refs Presented at 32nd PSI Ann. Secretarial Inst., Knoxville, Tenn., 6 Mar. 1985
(Contract DE-AC05-84CS-21400)
(DE85-008154; Y/DL-914; CONF-8503118-1) Avail: NTIS HC A03/MF A01

A brief history is given of the efforts at utilization of mainframe computers, personal or desktop computers, standalone word processors, and other such devices at Martin Marietta Energy Systems in Oak Ridge, Tennessee. This discussion is concentrated on how these systems have been used in the office, both for purely technical and management oriented applications. Some detail is also given on how these systems have been used to solve some typical problems in offices, so that others might benefit from lessons learned. DOE

N85-28879# Advanced Technology, Inc., Reston, VA.
DLA: DATA/DATA BASE ADMINISTRATION ANALYSIS Final Report
R. GIROUARD 26 Feb. 1985 134 p
(Contract DLAH00-83-D-0225)
(AD-A153031) Avail: NTIS HC A07/MF A01 CSCL 05/2

The scope of this study addresses the following three questions: What Data/Data Base Administration (D/DBA) functions have to be performed to effectively manage the D/DBA environment in DLA? What tools are needed to support the D/DBA functions? What is the required organizational structure for the functions and tools and where should they be located throughout DLA? The goal of this study is to conduct an extensive review and assessment of existing Data/Data Base Administration methods and procedures to develop concepts, directions, and an organizational approach in accomplishing the management of automated information DLA wide. GRA

N85-30760# Brookhaven National Lab., Upton, NY. National Nuclear Data Center.
THE INTERNATIONAL SCOPE OF DATA EVALUATION
S. PEARLSTEIN 1985 8 p refs Presented at the Ann. Meeting of the American Nuclear Society, Boston, 9-14 Jun. 1985
(Contract DE-AC02-76CH-00016)
(DE85-005953; BNL-NCS-35794; CONF-850610-13) Avail: NTIS HC A02/MF A01

The principal national and international evaluation activities that contributed to the widespread use of evaluated data files are summarized. Those efforts that have become best known through the availability of data, documentation, and computer codes are emphasized. Early attempts at nuclear data evaluation consisted of improving communication among measurers of similar information. As reactor methodology proceeded from a four factor formula to multigroup theory the demand for detailed representation of nuclear data increased. The systematic access to large volumes of data required placing the information in computer readable formats. DOE

N85-31848# National Academy of Sciences - National Research Council, Washington, DC.
EVALUATIVE REPORT ON THE INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY, NATIONAL BUREAU OF STANDARDS, FISCAL YEAR 1984
Dec. 1984 13 p Sponsored by NBS
(PB85-176097) Avail: NTIS HC A03/MF A01 CSCL 09/2

The technical functions and programs of the Institute for Computer Sciences and Technology, one of the major organizational units of the National Bureau of Standards were evaluated. The report deals with only a part of the total NBS effort. GRA

N85-32038# National Academy of Sciences - National Research Council, Washington, DC.
NAVY INFORMATION SYSTEMS: PLANNING, POLICY, ORGANIZATION, AND MANAGEMENT Final Report
Jan. 1985 60 p
(Contract N00014-80-C-0160)
(PB85-176113) Avail: NTIS HC A04/MF A01 CSCL 05/2

The committee automatic data processing that reviewed Navy's management and planning of (ADP) systems presents its findings. Committee recommends new thrust that focuses on information rather than transactional ADP systems; change ADP systems into information systems. The following specific recommendations were made: The Navy needs a strong advocate of information systems at Chief of Naval Operations-level (CNO), Create a new CNO division, Information Systems Division, under a flag officer to report to Command and Control. How well the Navy has implemented the committee's recommendations is discussed. GRA

N85-32825# Naval Postgraduate School, Monterey, CA.
THE ARCHITECTURAL REQUIREMENTS AND INTEGRATION ANALYSIS OF A DATABASE SERVER FOR OFFICE AUTOMATION
S. A. DEMURJIAN, D. K. HSIAO, and R. G. MARSHALL May 1985 21 p
(Contract PROJ. RR0-1408)
(AD-A155517; NPS52-85-008) Avail: NTIS HC A03/MF A01 CSCL 09/2

Office automation systems are growing both in use and in complexity. The development of a database management system for the office automation environment becomes a high priority, in order to provide an efficient and reliable way to manage the information needs of the office. Therefore, the specification of a database server for the office automation environment becomes a key area of concern. In addition to providing traditional database support, the database server must also provide new database support, so as to meet the unique and many needs of office automation environments. This paper focuses on the characterization and specification of a database server for the office automation environment. It also considers how such a database server can be effectively integrated into the office automation environment. The authors use both intuitive comparisons and queing-theory analyses to evaluate the various integration approaches. Further, they examine an experimental database system, known as the multibackend database system,

as a candidate for the database server in the office automation environment. Author (GRA)

N85-33043# Defense Technical Information Center, Alexandria, VA.
THE FLOW OF SCIENTIFIC AND TECHNICAL INFORMATION IN THE US ARMY RESEARCH LABORATORIES Final Report
R. L. BIXBY May 1985 52 p
(AD-A155050; DTIC/TR-85/4) Avail: NTIS HC A04/MF A01 CSCL 05/2

The Defense Technical Information Center (DTIC) provides information services to the Army, Navy, Air Force, other Department of Defense (DOD) agencies, other Government agencies, and Government contractors. In order to provide this information, DTIC needs to anticipate the information needs of its users. An understanding of the flow of scientific and technical information (STINFO) within DTIC user organizations is necessary to provide the best services. This paper was undertaken to trace the flow of STINFO within the Department of the Army's research laboratories and to determine how the Army researcher gathers information. Recommendations are made as to how DTIC can better serve the information needs of the Army. Author (GRA)

N85-33736# Sandia National Labs., Albuquerque, NM.
INTEGRATION OF OFFICE AUTOMATION WITHIN COMPUTING
1985 19 p Presented at the DOE Conf. on Office Automation, Albuquerque, N. Mex., 24 Apr. 1985
(Contract DE-AC04-76DP-00789)
(DE85-010021; SAND-85-0925C; CONF-8504129-1) Avail: NTIS HC A03/MF A01

An informal talk is given that focuses on the coupling between office automation efforts and the traditional fields of computing, particularly management information systems. DOE

N85-35818# Oak Ridge Associated Universities, Inc., TN.
ELECTRONIC INFORMATION MANAGEMENT AND PRODUCTIVITY
E. B. SIGMON Apr. 1985 40 p
(Contract DE-AC05-76OR-00033)
(DE85-013362; ORAU/IEA-85-3(M)) Avail: NTIS HC A03/MF A01

Electrification leads to technological advances because its characteristic flexibility and controllability circumvent barriers inherent with other means of delivering energy to processes. Typically, the productivity impacts of electrification occur in two stages: Small gains are realized when the electric technology is directly substituted for the established non-electric technology; larger gains accrue from subsequent reorganization of the production process permitted by the superior flexibility of the electric technology. Electricity's role as an information medium is examined and parallels to its role as an energy medium are found. Electronic information technologies (e.g., robotics and word processing) permit mechanization of complex, low volume tasks formerly too expensive to mechanize. Yet experts expect the greatest gains to come from subsequent linking of individual electronically mechanized tasks into an integrated unit in which information barriers between tasks are largely eliminated. Again, the unique flexibility of electricity leads to technological progress. DOE

N85-35823# Naval Research Lab., Washington, DC.
RECORDS DISPOSAL: A GUIDEBOOK FOR LABORATORY OFFICES
J. A. S. PITTS Apr. 1985 58 p
(AD-A156064; AD-E301677) Avail: NTIS HC A04/MF A01 CSCL 05/2

A guidebook for the disposal of U.S. Government laboratory records includes among the types of temporary or permanent records any that have been produced at goverment expense or on government time. They are to be reviewed periodically by a project manager or other accountable official. The records can be either stored or destroyed. Instructions are given for the separate disposal of the following types of records: general office records; scientific and technical program records; program management records; data and specifications records; technical report files; audiovisual records; and personal files. F.M.R.

N86-15174*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.
OFFICE AUTOMATION: THE ADMINISTRATIVE WINDOW INTO THE INTEGRATED DBMS
G. H. BROCK *In* NASA. Johnson (Lyndon B.) Space Center R and D Productivity: New Challenges for the US Space Program p 192-201 1985
Avail: NTIS HC A25/MF A04 CSCL 05/2

In parallel to the evolution of Management Information Systems from simple data files to complex data bases, the stand-alone computer systems have been migrating toward fully integrated systems serving the work force. The next major productivity gain may very well be to make these highly sophisticated working level Data Base Management Systems (DMBS) serve all levels of management with reports of varying levels of detail. Most attempts by the DBMS development organization to provide useful information to management seem to bog down in the quagmire of competing working level requirements. Most large DBMS development organizations possess three to five year backlogs. Perhaps Office Automation is the vehicle that brings to pass the Management Information System that really serves management. A good office automation system manned by a team of facilitators seeking opportunities to serve end-users could go a long way toward defining a DBMS that serves management. This paper will briefly discuss the problems of the DBMS organization, alternative approaches to solving some of the major problems, a debate about problems that may have no solution, and finally how office automation fits into the development of the Manager's Management Information System. Author

N86-16923# National Bureau of Standards, Gaithersburg, MD.
REFERENCE MODEL FOR DBMS (DATABASE MANAGEMENT SYSTEM) STANDARDIZATION
D. K. JEFFERSON and E. N. FONG May 1985 79 p
(PB85-225217; NBSIR-85/3173) Avail: NTIS HC A05/MF A01 CSCL 09/2

Reference Model (RM) for database management system (DBMS) standardization. A Reference Model is a conceptual framework whose purpose is to divide standardization work into manageable pieces and to show at a general level how these pieces are related with each other. The proposed RM comprises a data mapping control system (DMCS) that retrieves and stores application data, application schemas, and data dictionary schemas. This DMCS is bounded by two interfaces: the data language (DL) interface which defines the services offered by the DMCS to various data management tools (DMT), and the internal data language (i-DL) interface which defines the services required by the DMCS from the host operating system. Two candidates for standardization: the DL and the -DL are proposed. GRA

N86-18004# National Bureau of Standards, Gaithersburg, MD. Center for Programming Science and Technology.
TECHNICAL OVERVIEW OF THE INFORMATION RESOURCE DICTIONARY SYSTEM
A. GOLDFINE and P. KONIG Apr. 1985 135 p
(PB85-224491; NBSIR-85/3164) Avail: NTIS HC A07/MF A01 CSCL 09/2

A technical overview of the computer software specifications for the information Resource Dictionary System (RDS) is presented. It summarizes the data architecture and the software functions and processes of the IRDS. The IRDS Specifications are a draft proposed American National Standard, a draft proposed U.S. Federal Information Processing Standard, and a Working Document of the International Organization for Standardization (ISO), Subcommittee 21, Working Group 3. The overview also provides background information on the development of the draft proposed U.S. standards. GRA

N86-18246# Oak Ridge National Lab., TN.
INFORMATION SYSTEMS DEVELOPMENT AIDS
M. L. EMRICH and R. BRYANT Aug. 1985 117 p
(Contract DE-AC05-84OR-21400)
(DE85-018161; ORNL/TM-9647) Avail: NTIS HC A06/MF A01

Information engineers use a variety of techniques, procedures and methodologies to specify, design, program, test, and maintain Information Systems. Various automated tools are available for assisting the information engineer in this work. This document seeks to provide a general overview of the development life-cycle process and of tools available for assisting in that process. DOE

N86-19960# Office of Technology Assessment, Washington, DC.
INFORMATION TECHNOLOGY R AND D: CRITICAL TRENDS AND ISSUES
Feb. 1985 52 p
(PB85-245660; OTA-CIT-268; LC-84-601150) Avail: NTIS HC A04/MF A01 CSCL 09/2

Four specific areas of research as case studies are examined: (1) computer architecture; (2) artificial intelligence; (3) fiber optics; and (4) software engineering. The structure and orientation of some selected foreign programs are discussed. A set of issues that have been raised in the course of the study manpower, institutional change and the new research organizations that grew out of Bell Laboratories and implications of trends in overall science and technology policy are examined. GRA

N86-25299# Office of Management and Budget, Washington, DC.
MANAGING FEDERAL INFORMATION RESOURCES: REPORT UNDER THE PAPERWORK REDUCTION ACT OF 1980
Sep. 1985 54 p refs
(PB86-247682; AR-4) Avail: NTIS HC A04/MF A01 CSCL 05/2

Topics covered include: controlling paperwork (information collection reviews, the information collection budget, other paperwork reduction act activities, legislative activites and issues, delegation of clearance authority); information policy (information technology planning process, federal information policy circular, federal telecommunications systems, security of information technology systems, protecting personal privacy, coordination of U.S. Government information flows in support of international affairs, Office of Management and Budget's leadership role); and statistical policy (long range planning, evaluation, coordination standards, major statistical policy issues addressed in 1984 to 1985). GRA

N86-27110# George Mason Univ., Fairfax, VA. Technology Transfer Study Center.
TECHNOLOGY TRANSFER AT DARPA: THE DEFENSE ADVANCED RESEARCH PROJECTS AGENCY. EXECUTIVE SUMMARY
R. G. HAVELOCK and D. S. BUSHNELL Dec. 1985 15 p refs
(Contract MDA903-84-K-0031; ARPA ORDER 5156)
(AD-A164503) Avail: NTIS HC A03/MF A01 CSCL 05/1

Five distinct transfer issues were uncovered, namely: (1) transfer within programs (intra-transfer); (2) transfer to military users (hand-off); (3) transfer to non-military users (spin-off); (4) undesired transfer or leakage (defined as the problem of knowledge containment); and (5) transfer into DARPA from other sources (in-transfer). Five specific recommendations are offered for early action to begin a more coherent and aggressive approach to transfer issues within the Agency. First, the Agency should immediately appoint a technology transfer facilitator to oversee the transition of developed technology to military use. Second, it should develop a state-of-the-art on-line retrieval system for tracking data on all projects and proposals. Third, it should develop a new system of program tracking to identify critical stages and outcomes, which we call transition analysis. Fourth, it should convene a panel on access to unclassified technical knowledge. Finally, it should establish an annual forum for the review of newly emerging technologies. A brief summary of each recommendation is given. GRA

N86-30378*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
SEARCH AND RETRIEVAL OF OFFICE FILES USING DBASE 3
W. L. BREAZEALE and C. R. TALLEY Aug. 1986 85 p
(NASA-TM-86550; NAS 1.15:86550) Avail: NTIS HC A05/MF A01 CSCL 09/2

Described is a method of automating the office files retrieval process using a commercially available software package (dBASE III). The resulting product is a menu-driven computer program which requires no computer skills to operate. One part of the document is written for the potential user who has minimal computer experience and uses sample menu screens to explain the program; while a second part is oriented towards the computer literate individual and includes rather detailed descriptions of the methodology and search routines. Although much of the programming techniques are explained, this document is not intended to be a tutorial on dBASE III. It is hoped that the document will serve as a stimulus for other applications of dBASE III.
Author

N86-33200# Texas A&M Univ., College Station. College of Business Administration.
ORGANIZATION AS INFORMATION PROCESSING SYSTEMS: TOWARD A MODEL OF THE RESEARCH FACTORS ASSOCIATED WITH SIGNIFICANT RESEARCH OUTCOMES
R. L. DAFT, R. W. GRIFFIN, and V. YATES Apr. 1986 59 p
(Contract N00014-83-C-0025)
(AD-A168018; TR-DG-19-ONR) Avail: NTIS HC A04/MF A01 CSCL 05/2

Three models with the potential to explain significant organizational research outcomes were proposed and tested. Fifty-six organizational scholars were surveyed about one significant and one not-so-significant research project. The findings identified several reported factors that occurred prior to and during research projects that were related to research outcomes. The Ambidextrous model, which includes both organic and mechanistic research characteristics, differentiated significant from not-so-significant research better than the Davis and Antecedents models.
Author (GRA)

N86-33201# Texas A&M Univ., College Station. Dept. of Management.
ORGANIZATIONS AS INFORMATION PROCESSING SYSTEMS: ENVIRONMENTAL CHARACTERISTICS, COMPANY PERFORMANCE AND CHIEF EXECUTIVE SCANNING, AN EMPIRICAL STUDY
R. DAFT, J. SORMUNEN, and D. PARKS Apr. 1986 59 p
(Contract N00014-83-C-0025)
(AD-A168035; TR-DG-20-ONR) Avail: NTIS HC A04/MF A01 CSCL 05/2

Chief executives in fifty manufacturing companies were interviewed about the perceived strategic uncertainty in six environmental sectors, and the frequency and mode of scanning used for each sector. The findings suggest customer, economic, and competitor sectors generated greater strategic uncertainty than technological, regulatory, and socio-cultural sectors. When sector uncertainty was high, executives reported greater frequency of scanning and greater use of personnal information sources. Chief executives in high performing companies scanned more frequently and more broadly in response to strategic uncertainty than their counterparts in low performing companies. GRA

N86-33204# General Accounting Office, Washington, DC. General Government Div.
FREEDOM OF INFORMATION ACT: NONCOMPLIANCE WITH AFFIRMATIVE DISCLOSURE PROVISIONS
Apr. 1986 36 p
(AD-A168589; GAO/GGD-86-68) Avail: NTIS HC A03/MF A01 CSCL 05/1

To determine whether federal agencies were complying with the Freedom of Information Act's (FOIA) affirmative disclosure requirements, we interviewed officials of component organizations of the 13 cabinet-level departments and the Veterans Administration and evaluated their procedures. Our review was designed to assess compliance efforts at these organizations only, and the results can not be projected to the departments as a whole or to other organizations subject to FOIA requirements. At the 14 organizations we found that: in 13 instances, the U.S. Government organizations did not publish or keep current information on their central and field organizations; in six instances, organizations' published statements on where the public could obtain information were out of date; and one organization did not publish procedural information on its system of hearings and appeals. Officials in the 14 organizations attributed noncompliance with subsection (a)(1) to such reasons as delays in internal rules clearance processes, frequent agency reorganizations, and administrative error. Officials in some organizations also felt that publication of organization material in The United States Government Manual was sufficient compliance. In 20 instances, 60% of the organizations were not in full compliance with subsection (a)(2) requirements. Thus, these organizations did not provide members of the public the means to routinely identify and inspect all materials they might require in dealing with the organizations. GRA

N86-33206# Department of Energy, Washington, DC. Office of Computer Ser. and Telecommunications.
INFORMATION TECHNOLOGY RESOURCES LONG-RANGE PLAN, FY 1987-FY 1991
Dec. 1985 228 p
(DE86-010457; DOE/MA-0048-4) Avail: NTIS HC A11/MF A02

The objective of this plan is to describe the information technology resources and capabilities of the Department, the future requirements, and the strategies and plans to satisfy the identified requirements. The long-range planning process provides the systematic means to meet this objective and assists the Department in assuring that information technology support is provided in an efficient, effective, and timely manner so that the programmatic missions can be accomplished. Another objective of the Plan is to promote better understanding, both within and external to the Department, of its information technology environment, requirements, problems, and recommended solutions. The Plan covers the five-year period from fiscal year 1987 through 1991. It takes into consideration the information technology resource requirements of more than 52 different Departmental components and contractors. The IS section and resource identification is limited to business and project management type applications used by Departmental components. DOE

N87-13353# Naval Postgraduate School, Monterey, CA.
FEDERAL INFORMATION SYSTEMS MANAGEMENT: PROBLEMS, SOLUTIONS AND MORE PROBLEMS Final Report
D. C. BOGER, C. R. JONES, and N. R. LYONS Jul. 1986 28 p
(AD-A171366; AD-F250645; NPS-54-86-006) Avail: NTIS HC A03/MF A01 CSCL 05/1

Although there are numerous problems associated with the management of Federal information systems, the usual solutions proposed for these problems have had and will have little, if any, effects. This paper examines the characteristics of Federal information systems and shows that most proposed solutions are directed at symptoms of the problems and not at their underlying causes. These solutions do not reflect the public sector nature of Federal information systems and hence, are either unrealistic or ineffectual. The authors do not propose another panacea. GRA

N87-15902# Defense Technical Information Center, Alexandria, VA.
SYSTEMATIC CORPORATE PLANNING AT DTIC (DEFENSE TECHNICAL INFORMATION CENTER) Final Report
GEORGENE C. CHASTAIN and R. R. PARRIS Aug. 1986 18 p
(AD-A171525; DTIC/TR-86/19) Avail: NTIS HC A03/MF A01 CSCL 05/1

The Defense Technical Information Center (DTIC) has recently committed itself to a long-range corporate planning process. The purpose of this technical report is to describe this corporate planning process, to document those steps DTIC has taken to implement the corporate plans, and to present lessons learned for use in future planning endeavors. Author (GRA)

N87-20131# Naval Postgraduate School, Monterey, CA.
TOWARD HIGHLY PORTABLE DATABASE SYSTEMS: ISSUES AND SOLUTIONS M.S. Thesis
ALBERT WONG Jun. 1986 93 p
(AD-A174635) Avail: NTIS HC A05/MF A01 CSCL 09/2

The multi-backend database system (MBDS) is a database system of two or more processors and their dedicated disk subsystems. One of the processor serves as a controller. The rest of the processors and their disks serves as backends to provide the primary and parallel database operations. User access to the MBDS is accomplished either via a host computer which in turn communicates with the controller, or with the MBDS controller directly. The thesis is aimed to examine the portability of MBDS. By downloading the MBDS software form the configuration of VAX and PDP hardware and VMS and RSX operating systems to the configuration of the 32-bit microprocessor-based ISI hardware and UNIX operating system, we hope to determine the necessary amount of hardware-and-operating-system-dependent modifications and reinstrumentations in order to make the downloading successful. The ultimate goal of the thesis is to recommend to the future database-system designer the way to minimize the amount of configuration-dependent software and to strive for a truly and highly portable system to be used on various configurations. This thesis has identified three major portability issues and provided solutions to them. They are the multiple-record template support, the interprocess communication via broadcasting, and the disk I/O for the real-time access. GRA

N87-21737# National Archives and Records Service, Washington, DC. Archival Research and Evaluation Staff.
MARC (MACHINE READABLE CATALOG) FORMAT AND LIFE CYCLE TRACKING AT THE NATIONAL ARCHIVES: A STUDY Final Report
E. HEDLIN and T. E. WEIR May 1986 343 p
(PB87-126256; NARA/TIP-86/02) Avail: NTIS HC A15/MF A02 CSCL 05/2

The National Archives conducted an 18 month study of life cycle tracking of records, the Machine Readable Catalog/Archival and Manuscript Control format (MARC/AMC), and the Research Libraries Information Network (RLIN). Life cycle tracking is the ability for the National Archives to capture and exchange information about Federal records from their creation to their destruction or use in an archives. It is proposed that the National Archives adopt the concept of life cycle tracking. This will require some changes in current procedures and the standardization of fields and vocabularies. The MARC/AMC is a data exchange format recently adopted by the Society of American Archivists for information interchange. The study found the format contained fields adequate for the description of Federal records. The format, however, does not support needed data structures. The Research Libraries Information Network is an information sharing service of the Research Libraries Group. RLN was found to be a medium for the exchange of information but was not found to be suitable as the primary automation tool for the National Archives and Record Administration. Author

N87-22551# General Accounting Office, Washington, DC.
SPACE OPERATIONS: NASA'S USE OF INFORMATION TECHNOLOGY. REPORT TO THE CHAIRMAN, COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY
Apr. 1987 67 p
(GAO/IMTEC-87-20; B-226577) Avail: NTIS HC A04/MF A01

An overview of the information technology that is critical to

the missions of NASA are provided. Planning, development, and use of information for three areas (Space Transportation System, space stations, and unmanned space exploration) are discussed. B.G.

N87-24227# Assistant Secretary of Defense (Comptroller), Washington, DC.
DOD (DEPARTMENT OF DEFENSE) PROCEDURES FOR MANAGEMENT OF INFORMATION REQUIREMENTS
R. DRAKE Nov. 1986 112 p
(PB87-155495; DOD-7750.5-M) Avail: NTIS HC A06/MF A01 CSCL 05/1

The Manual guides action officers who need to establish reports or obtain information from the public, other Federal agencies, or DoD Components and provides them with the necessary information to license their information requirements. In addition, it contains information to assist program managers in the operation of their reports management programs. GRA

N87-25878# Office of Management and Budget, Washington, DC.
MANAGING FEDERAL INFORMATION RESOURCES: REPORT UNDER THE PAPERWORK REDUCTION ACT OF 1980 Annual Report No. 5
Apr. 1987 62 p
(PB87-114138) Avail: NTIS HC A04/MF A01 CSCL 05/2

The report describes the Office of Management and Budget's progress in managing and overseeing information gathering, processing, and dissemination functions of the Federal government. It includes progress and continuing efforts in strengthening information management within the Federal government, improving Federal statistical programs and reducing information collection burdens imposed upon the public as well as State and local governments. GRA

N87-26680# National Technical Information Service, Springfield, VA.
STRATEGIC PLANNING PROCESS AT THE NATIONAL TECHNICAL INFORMATION SERVICE
JOSEPH F. CAPONIO and DONALD S. BUDOWSKY *In* Advisory Group for Aerospace Research and Planning and Designing Effective Defence and Related Information Services 6 p Apr. 1987
Copyright Avail: NTIS HC A06/MF A01

External trends such as the growth of the information society, the increasing economic value of information, the growth of research and development, funding, and advances in automation have dictated the need for information services to have a strong commitment to strategic planning. These trends are discussed and the strategic planning process at the National Technical Information Service (NTIS) is outlined. Author

N87-28458# Environmental Protection Agency, Washington, DC. Information Management and Services Div.
BIBLIOGRAPHY ON INFORMATION RESOURCES MANAGEMENT
Nov. 1985 45 p
(PB87-185997; EPA/IMSD-85/003) Avail: NTIS CSCL 05/2

The bibliography documents the controversy over the definition of information resources management (IRM) from office automation systems and management information systems to the current user oriented state of the art. It includes citations from 1980, when the Paperwork Reduction Act was passed, to the present. A survey of expert opinion of future developments of IRM is included, as are case studies of IRM as implemented in various organizations. Author

N87-29371# Virginia Polytechnic Inst. and State Univ., Blacksburg. Management Systems Labs.
RESEARCH AND DEVELOPMENT OF MODELS AND INSTRUMENTS TO DEFINE, MEASURE, AND IMPROVE SHARED INFORMATION PROCESSING WITHIN GOVERNMENT OVERSIGHT AGENCIES Annual Performance Report, Aug. 1986 - Feb. 1987
H. A. KURSTEDT, JR. 1987 45 p
(Contract DE-FG05-86DP-70033)
(DE87-012473; DOE/DP-70033/1) Avail: NTIS HC A03/MF A01

The tangible result of the research effort will be an integrated set of descriptive, prescriptive, predicative, performance, and responsive tools that will collectively allow government oversight agencies (GOAs) to increase their performance to the highest levels possible. GOAs will see increases in productivity, fewer conflicts between headquarters and the field, greater motivation on the part of personnel who actively share in the process of decision making, and greater credibility with Congress, the public, and the media. This results from the consistency and integrity of data and information - and the correct perception of government running a tight ship. DOE

N88-11571# Center for Social and Economic Issues, Ann Arbor, MI.
IMPLEMENTING AND MANAGING CHANGE: A GUIDE FOR ASSESSING INFORMATION TECHNOLOGY
J. A. MORELL, R. GRYDER, and M. FLEISCHER Aug. 1987 100 p Prepared in cooperation with ORNL, Tenn.
(Contract DE-AC05-84OR-21400)
(DE88-000035; ORNL/TM-10520) Avail: NTIS HC A05/MF A01

Assessing the impact of office automation (OA) requires expertise in the generic aspects of evaluation and innovation adoption, combined with specialized knowledge of OA. There is an extensive literature on the two generic subjects, but no companion literature concerning the application of the knowledge to the unique case of OA. By providing that specialized information, this report assists the implementors of OA in two ways: it shows them how to monitor implementation efforts, thus providing feedback to facilitate adoption of OA technology; and it provides guidance for measuring OA's impact on people and organizations. The report assumes an immediate impact of OA on the work groups where the technology is implemented, and a continually spreading effect from that locus of immediate use. Included in the report are discussions of: sources of data, methods of data collection, factors which affect implementation, and measures of impact. Special attention is given to measuring productivity changes that may result from the use of OA. A detailed appendix supplies a variety of examples which show how the variables discussed in the report were actually measured in applied settings. DOE

N88-12412*# Draper (Charles Stark) Lab., Inc., Cambridge, MA.
ADVANCED INFORMATION PROCESSING SYSTEM (AIPS) PROOF-OF-CONCEPT SYSTEM FUNCTIONAL REQUIREMENTS I/O NETWORK SYSTEM SERVICES
28 Feb. 1985 44 p
(Contract NAS9-16023)
(NASA-CR-181481; NAS 1.26:181481; CSDL-AIPS-84-138)
Avail: NTIS HC A03/MF A01 CSCL 05/2

Requirements for input/output user communication; network control; status logging, collection, and reporting; test support; and functional interfaces are presented. B.G.

N88-12415# Du Pont de Nemours (E. I.) and Co., Aiken, SC. Savannah River Plant.
ELECTRONIC RECORDS ADMINISTRATION AT THE SAVANNAH RIVER PLANT
B. J. HUDSON 1987 14 p Presented at the Department of Energy Automated Office Support System Conference, Denver, Colo., 7-8 Oct. 1987 Submitted for publication
(Contract DE-AC09-76SR-00001)
(DE87-014842; DP-MS-87-103; CONF-8710132-4) Avail: NTIS HC A03/MF A01

The Savannah River Plant (SRP), operated by DuPont for the

Department of Energy (DOE), is faced with the problem of providing ready access to information. A sitewide information network has been installed implementing electronic mail (ALL-IN-1) and various other office automation features. However, users need access to information contained in manuals, earlier research reports, and technical publications located in the central files. Planning is under way to procure a document and information storage and retrieval system linked to the sitewide information network. The system should provide retrieval of image scans of any document via full text and keyword searching of current and archived documents. Old documents will be input to the system through a high-speed image scanning system and optical disk storage. Optical character recognition (OCR) will be performed on these images and the resulting text stored in a document search and retrieval system. A user will utilize the search system to identify the documents needed, and retrieve either the text only from the search system or the image scan from the optical storage system. DOE

N88-12417# Oak Ridge National Lab., TN.
THE IMPACT OF INFORMATION TECHNOLOGY ON RESEARCH IN SCIENCE AND ENGINEERING
JONATHAN A. MORELL 1987 29 p Presented at the Howard R. Davis Society for Knowledge Utilization, Pittsburgh, Pa., 9 Oct. 1987
(Contract DE-AC05-84OR-21400)
(DE88-000342; CONF-8710147-1) Avail: NTIS HC A03/MF A01

There is little research on the impact of information technology (IT) on how research is carried out by scientists and engineers. This paper draws on other bodies of writings which indirectly shed light on this question. Included are: the role of calculation in research, scientific productivity, the philosophical underpinnings of science and technology, systems analysis, and the use of computer aided design in engineering. A model is developed which helps identify the types of impact that IT may have on social system and epistemological aspects of research. Factors are hypothesized which may explain why IT may have particular effects in any given research endeavor. DOE

N88-16577*# National Academy of Sciences - National Research Council, Washington, DC.
CRITICAL ISSUES IN NASA INFORMATION SYSTEMS Final Report
Jun. 1987 68 p
(Contract NASW-4124)
(NASA-CR-182380; NAS 1.26:182380; PB88-101027) Avail: NTIS HC A04/MF A01 CSCL 05/2

The National Aeronautics and Space Administration has developed a globally-distributed complex of earth resources data bases since LANDSAT 1 was launched in 1972. NASA envisages considerable growth in the number, extent, and complexity of such data bases, due to the improvements expected in its remote sensing data rates, and the increasingly multidisciplinary nature of its scientific investigations. Work already has begun on information systems to support multidisciplinary research activities based on data acquired by the space station complex and other space-based and terrestrial sources. In response to a request from NASA's former Associate Administrator for Space Science and Applications, the National Research Council convened a committee in June 1985 to identify the critical issues involving information systems support to space science and applications. The committee has suggested that OSSA address four major information systems issues; centralization of management functions, interoperability of user involvement in the planning and implementation of its programs, and technology. GRA

N88-18510# Oak Ridge National Lab., TN.
GUIDELINES FOR EXCHANGING COMPUTERIZED INFORMATION
R. J. OLSON, T. A. BODEN, J. A. SOLOMON, V. H. DALE, and S. W. CHRISTENSEN 1987 6 p Presented at the Piecing the Puzzle Together: A Conference on Integrating Data for Decisionmaking, Washington, D.C., 27 May 1987
(Contract DE-AC05-84OR-21400)
(DE88-004736; CONF-8705147-4) Avail: NTIS HC A02

The exchange of computerized information is becoming more routine; however, it is often a time-consuming and frustrating process. Based on our experience in developing several large data bases at Oak Ridge National Laboratory, we estimate that there may be problems with at least one-third of the data files that are received or sent. The average time required to process data transferred from extant sources (based on records for 56 transfers) increased 37 percent when problems were encountered compared with the average processing time required for data files without significant problems. The majority of problems were related to inadequate documentation (49 percent). Other problems included hardware or software incompatibilities, errors in the tape or disk, errors or inconsistencies in the data, and transmittal of the wrong data set. Based on this analysis, we have developed guidelines for exchanging computerized information, giving the types of information needed to adequately document a file, define the transfer medium, and verify that information is correctly received. The guidelines are meant to be adapted to individual situations as appropriate. DOE

N88-23680# Army Engineer Studies Center, Fort Belvoir, VA.
THE ENGINEER STUDIES CENTER GUIDE TO RESEARCH AND DATA COLLECTION Final Report, Sep. - Oct. 1987
RICHARD L. TAYLOR, DOUGLAS LEHMAN, and JILL DAVIS 30 Nov. 1987 31 p
(AD-A189971; USAESC-R-88-2) Avail: NTIS HC A03/MF A01 CSCL 12/1

THis paper provides tips and guidelines for use in facilitating better research and data collection when undertaking US Army studies and analysis. It is intended for use by analysts and military planners at the US Army Engineer Studies Center (ESC). However, the tips provided herein are applicable throughout the US Army study analysis community. This report specifically gives background on the ESC study process, focuses on the research phase of the ESC study process, provides ten tips for better research and data collection, and provides several observations on the research collection process. An annex listing selected libraries used often by ESC analysts is also provided. GRA

N88-30354*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
AUTOMATED CATALOGING AND CHARACTERIZATION OF SPACE-DERIVED DATA
WILLIAM J. CAMPBELL, LARRY ROELOFS, and MICHAEL GOLDBERG (Mitre Corp., McLean, Va.) *In its* The 1988 Goddard Conference on Space Applications of Artificial Intelligence p 343-354 Aug. 1988
Avail: NTIS HC A19/MF A03 CSCL 05/2

One of the most significant technical issues that NASA must address and resolve is the problem of managing the enormous amounts of scientific and engineering data that will be generated by the next generation of remote sensing systems such as the Hubble Space Telescope (HST) and the Earth Observing System (EOS). The amount of data these sensors are expected to produce will be orders of magnitude greater than NASA has ever experienced. Consequently new solutions must be developed for managing, accessing, and automatically inputting the data into a database in some expressive fashion that will provide a meaningful understanding and effective utilization of this data in a multidisciplinary environment. Presently, scientific data provided by satellites and other sources are processed, cataloged, and archived according to narrow mission or project-specific requirements with little regard to the semantics of the overall research. Scientists therefore lack knowledge of or access to potentially valuable data outside their own field. What is needed is an innovative approach that will allow collected data to be automatically cataloged, characterized, and managed in a domain-community. A concept and design approach that employs expert system-based knowledge controllers combined with advanced spatial database systems and graphical data structures is discussed. Author

N88-30457# Massachusetts Inst. of Tech., Cambridge.
STRATEGIC, ORGANIZATIONAL AND STANDARDIZATION ASPECTS OF INTEGRATED INFORMATION SYSTEMS, VOLUME 6 Final Report, Sep. 1986 - Jan. 1988
AMAR GUPTA and STUART MADNICK Dec. 1987 259 p
Sponsored in part by DOT, DOD and AF
(Contract DTRS57-85-C-00083)
(AD-A195855; AD-E500978; MIT-KBIISE-6) Avail: NTIS HC A12/MF A02 CSCL 12/7

This volume highlights key strategic and organizational issues involved in integrating heterogeneous information systems. It is divided into four parts. The first part, Towards a CIS Model for Strategic Applications, explores the nature of strategic goals underlying composite information systems (CIS) and ways to increase the likelihood of success. These aspects are analyzed using an example in which the relationship between the constituents is loosely-coupled and inter-dependent. The second part, Interorganizational Information Systems Via Information Technology: A Network Perspective, deals with the evolution of organizational theory and the importance of inter-organizational information networks. By effective establishment and use of these networks, participating organizations can realize competitive advantages in the marketplace. The third part, The Use of Standard Data Definitions in Composite Information Systems, describes the problems involved in establishing common standards. The fourth part describes a methodology for the development of standards for data exchange in an integrated environment. GRA

N89-11403# Air Force Inst. of Tech., Wright-Patterson AFB, OH.
THE USE OF PORTABLE MICROCOMPUTER AS A DATA COLLECTION TOOL TO SUPPORT INTEGRATED SIMULATION SUPPORT ENVIRONMENTS: A CONCEPT M.S. Thesis
JAMES E. WILKINSON 1988 122 p
(AD-A196414; AFIT/CI/NR-88-76) Avail: NTIS HC A06/MF A01 CSCL 12/5

While an integrated simulation environment provides a more organized structure for managing and performing simulation projects, and provides a database management structure for storing, manipulating, and analyzing data, they do not address the actual process of going out and obtaining the data. As a result, many of the common problems associated with poor problem and system definition, and low quality model input data, may still occur. To solve this problem, this study examines the concept of developing a support-support system; a portable microcomputer with software tools designed to support collection of the data, both subjective and objective, required in a simulation study. This data can then be ported into the integrated support system for analysis and model development. In developing this concept, the simulation process is better defined using structured analysis diagrams. Based on this analysis the functions that a support-support system could best accomplish are identified and a conceptual specification developed. An implementation strategy is proposed which is based on the use of readily available software tools, such as dBASE III, an the use of a simple programming language, such as BASIC. To demonstrate how this strategy can be implemented, a BASICA program was developed to support model input data collection. Using a graphic display to define input data requirements and single key inputs, this program should maximize the time an analyst can spend observing the system and minimize the time spent on entering data. GRA

N89-11412# National Bureau of Standards, Gaithersburg, MD. Information Systems Engineering Div.
STANDARDS CONFORMANCE TESTING Report, 1980 - 1987
SHARON J. KEMMERER May 1988 61 p
(PB88-215645; NBSIR-88/3768) Avail: NTIS HC A04/MF A01 CSCL 09/2

The NBSIR suggests a process to follow when developing a conformance testing program for appropriate NBS/ICST Federal Information Processing Standards (FIPS). These FIPS and the standards they are promoting are implemented into software products by commercial use. A consistent application of testing processes and specific test suites will help align commercial products to conform to these standards. Application of such a testing process will become more critical as Federal agencies begin to request procurement of software implementing these standards. GRA

N89-11626# King Research, Inc., Rockville, MD.
EVALUATING THE EFFECTIVENESS OF INFORMATION USE
DONALD W. KING and JOSE-MARIE GRIFFITHS *In* AGARD, Evaluating the Effectiveness of Information Centres and Services 5 p Sep. 1988
Copyright Avail: NTIS HC A05/MF A01

An approach to evaluating the use, usefulness and value of published/recorded information on the work of its users is described. The reading patterns of professionals and the application of information derived from reading is discussed in detail. Several different indicators of productivity of professionals are developed and correlated with the amount of reading that is done. Finally, several different perspectives on the value of information centers to the professionals they serve are presented. Author

N89-11629# King Research, Inc., Rockville, MD.
EVALUATING THE PERFORMANCE OF INFORMATION CENTRE STAFF
JOSE-MARIE GRIFFITHS and DONALD W. KING *In* AGARD, Evaluating the Effectiveness of Information Centres and Services 11 p Sep. 1988
Copyright Avail: NTIS HC A05/MF A01

The framework for evaluation described in 'A Framework for Evaluating the Effectiveness of Information Centers and Services for evaluating staff performance is used. Information center staff are a major resource affecting the overall performance and effectiveness of services provided. Various measures of staff performance are discussed (including quantities, quality and timeliness of staff outputs), and the relationship between staff performance and the effectiveness of services (from a user perspective) is demonstrated. Finally, alternative methods for measuring staff performance are described. Author

N89-11630# King Research, Inc., Rockville, MD.
EVALUATING PERFORMANCE OF INFORMATION CENTRE OPERATIONS AND SERVICES
JOSE-MARIE GRIFFITHS and DONALD W. KING *In* AGARD, Evaluating the Effectiveness of Information Centres and Services 8 p Sep. 1988
Copyright Avail: NTIS HC A05/MF A01

Evaluation of information center resources (e.g, staff, equipment, facilities, etc.) is discussed in terms of input costs, output performance, and productivity. Examples of evaluation of information services (e.g., access to technical reports and other publications, online bibliographic searches, published searches, etc.) are presented in terms of their input costs and output performance. The linking of resource attributes or characteristics (e.g., staff competencies, equipment capabilities, facility layout, etc.) to service input costs and output performance (e.g., quality and timeliness of services) is demonstrated. Thus, Center managers can make decisions about resources or allocation of funds involving resources in terms of services involved. A management information system for center management is also described. Author

N89-11631# King Research, Inc., Rockville, MD.
A FRAMEWORK FOR EVALUATING THE EFFECTIVENESS OF INFORMATION CENTRES AND SERVICES
DONALD W. KING and JOSE-MARIE GRIFFITHS *In* AGARD, Evaluating the Effectiveness of Information Centres and Services 14 p Sep. 1988
Copyright Avail: NTIS HC A05/MF A01

Evaluation is a subject of considerable attention at the current time. Three principal aspects of evaluation and information are presented here. The first involves the evaluation of information workers and services. The second deals with evaluation from the perspective of users served, their organizations and higher levels of aggregation such as to industries, sectors, the entire nation

and all nations. The third aspect is how information and information services affect users. Several levels within information service centers are described. One can perform evaluation at each of these levels (i.e, resource components, activities, services and products, functions and information units). That is, at each level one can measure input of resources (i.e, capital, labor, technology, information, etc.) and output quantities produced. Such output divided by input can provide estimates or indicators of productivity. The output of information services is one of several input resources to users. The extent to which this input affects output and productivity is of considerable interest. As shown in Figure 1 on the next page, the input resources (including information) affect user activities, their functions, their organizations, and so on, up to the point that aggregated information use and subsequent productivity affects national goals. Below we attempt to show how these interrelationships work. First, several definitions are given. Author

N89-11632# Bell Telephone Labs., Inc., Murray Hill, NJ. Libraries and Information Systems.
EVALUATING FOR INFORMATION CENTER PLANNING
W. DAVID PENNIMAN *In* AGARD, Evaluating the Effectiveness of Information Centres and Services 3 p Sep. 1988
Copyright Avail: NTIS HC A05/MF A01

A business-oriented approach to information center planning and evaluation is presented. The need for output measures a quantitative expression of service value is described and a method of planning incorporating these concepts is provided. Both top-down and bottom-up planning responsibilities are identified and the specific steps involved in a business planning process are given. The competitive nature of information service is emphasized throughout. Author

N89-12486 Texas Univ., Austin.
DECISION-ORIENTED STRATEGIC PLANNING FOR INFORMATION SYSTEMS: APPLYING CONCEPTUAL MODELS OF CRISIS DECISION-MAKING TO STRATEGIC PLANNING FOR CRISIS MANAGEMENT DECISION SUPPORT SYSTEMS Ph.D. Thesis
FREDERICK MAXIMILLIA BOCK, IV 1987 348 p
Avail: Univ. Microfilms Order No. DA8806296

Information systems to support decision-making in crisis situations are examined. In particular, it addresses the issue of developing a strategic plan for crisis information systems in an organization. A review of the nature of crises, current information systems planning approaches, and the role of conceptual models in crisis decision making is presented. It is argued that planning strategies grounded in time-stable process models of an organization are inappropriate for crisis information systems planning. As contrasted with emergencies, crises are neither stable nor predictable and lack well-definable processes upon which to base a plan. An alternative planning strategy is proposed based upon developing an information structure using conceptual models of crisis decision-making, particularly the Garbage Can Model of organizational choice proposed by Cohen, March and Olsen (1972). This alternative strategy, Decision-Oriented Strategic Planning for Information Systems (DSP/IS) is applied in a major military medical command; the application domain addressed is medical crisis management. The results are evaluated and then compared with the results of IBM's Information Systems Planning (ISP) process previously applied in the same command. Dissert. Abstr.

N89-12488 National Academy of Public Administration, Washington, DC.
FEDERAL INFORMATION RESOURCES MANAGEMENT: BRIDGING VISION AND ACTION
SHARON L. CAUDLE Jun. 1987 179 p
Copyright Avail: Issuing Activity

Information resources management (IRM) in federal cabinet-level executive departments and a random sample of bureaus under most of these departments is studied. An analysis of the perceptions of the managers and officials was performed. The study suggests three models for IRM in the federal government: an oversight model, a management model compared to the ideal IRM model in legislation and IRM founding documents, and a critical success factors model. Recommendations for practice are included. The study also recommends reasearch in the areas of information management, IRM skills, resource control, and program level IRM. B.G.

N89-14973*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
AN OVERVIEW OF THE USL/DBMS NASA/PC R AND D PROJECT WORKING PAPER SERIES Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. 15 Aug. 1984 8 p Revised Prepared in cooperation with Southern Univ., Baton Rouge, LA
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184533; NAS 1.26:184533; DBMS.NASA/PC-R/D-1)
Avail: NTIS HC A02/MF A01 CSCL 05/2

An introduction is given to the University of Southwestern Louisiana Data Base Management System (USL/DBMS) NASA/PC R and D Working Paper Series which has been established to provide a foundation for both a formal and informal information dissemination mechanism concerning PC-based research and development activities being performed pursuant to the NASA contract. This entry also serves as an index to the collection of Working Paper Series reports. Author

N89-14977*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
GENERAL SPECIFICATIONS FOR THE DEVELOPMENT OF A USL NASA PC R AND D STATISTICAL ANALYSIS SUPPORT PACKAGE Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed., JINOUS BASSARI, and SPIROS TRIANTAFYLLOPOULOS 2 Aug. 1984 16 p Prepared in cooperation with Southern Univ., Baton Rouge, La.
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184537; NAS 1.26:184537; DBMS.NASA/PC-R/D-5)
Avail: NTIS HC A03/MF A01 CSCL 05/2

The University of Southwestern Louisiana (USL) NASA PC R and D statistical analysis support package is designed to be a three-level package to allow statistical analysis for a variety of applications within the USL Data Base Management System (DBMS) contract work. The design addresses usage of the statistical facilities as a library package, as an interactive statistical analysis system, and as a batch processing package. Author

N89-14978*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
GENERAL SPECIFICATIONS FOR THE DEVELOPMENT OF A USL/DBMS NASA/PC R AND D DISTRIBUTED WORKSTATION Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. and FRANK Y. CHUM 15 Aug. 1984 12 p Prepared in cooperation with Southern Univ., Baton Rouge, La.
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184538; NAS 1.26:184538; DBMS.NASA/PC-R/D-6)
Avail: NTIS HC A03/MF A01 CSCL 05/2

The general specifications for the development of a PC-based distributed workstation (PCDWS) for an information storage and retrieval systems environment are defined. This research proposes the development of a PCDWS prototype as part of the University of Southwestern Louisiana Data Base Management System (USL/DBMS) NASA/PC R and D project in the PC-based workstation environment. Author

N89-17545# Oak Ridge National Lab., TN.
LIFE CYCLE MANAGEMENT HANDBOOK
C. E. SYNDER, T. D. MOTT (Evaluation Research Corp., Vienna, VA.), and J. W. CRUTCHER Sep. 1988 118 p
(Contract DE-AC05-84OR-21400)
(DE89-004315; ORNL/DSRD-13) Avail: NTIS HC A06/MF A01

Life cycle management (LCM) is a standard management discipline for acquiring and using information system resources in a cost-effective manner throughout the life of an information

system. Three life cycle management strategies are presented in this report. Section 2, which comprises most of the document, describes the full (five-phase) LCM strategy. The condensed LCM strategy and the one-phase LCM strategy are briefly discussed in Section 3. Appendix A gives examples of formats for system decision and project management documentation; Appendix B provides a list of defined acronyms; and an expanded contents, intended to serve as an index, appears in Appendix C. DOE

N89-18088# Naval Postgraduate School, Monterey, CA.
A DATABASE APPROACH TO COMPUTER INTEGRATED MANUFACTURING Ph.D. Thesis
DANA E. MADISON Jun. 1988 320 p
(AD-A201030) Avail: NTIS HC A14/MF A02 CSCL 13/8

This work presents a new approach to the integration of manufacturing activities. The manufacturing environment has capitalized on the use of automation to evolve to a highly specialized state characterized by heterogeneous systems providing computer support to the various activities. Conventional approaches to integration assume that these activities must continue to exist in their current relationships. We use a database approach to the integration problem which removes the traditional boundaries between activities. We develop a data model which captures more of the semantics of the manufacturing environment than existing models and allows us to take a data-oriented perspective of the activities it encompasses. We also show how the use of the data-oriented approach provides for integration of these activities and reduces the complexity of the manufacturing environment. GRA

N89-18392*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
THE IBM PC AT NASA AMES
JAMES P. PEREDO *In its* NASA Ames Summer High School Apprenticeship Research Program: 1986 Research Papers p 113-118 Sep. 1988
Avail: NTIS HC A07/MF A01 CSCL 09/2

Like many large companies, Ames relies very much on its computing power to get work done. And, like many other large companies, finding the IBM PC a reliable tool, Ames uses it for many of the same types of functions as other companies. Presentation and clarification needs demand much of graphics packages. Programming and text editing needs require simpler, more-powerful packages. The storage space needed by NASA's scientists and users for the monumental amounts of data that Ames needs to keep demand the best database packages that are large and easy to use. Availability to the Micom Switching Network combines the powers of the IBM PC with the capabilities of other computers and mainframes and allows users to communicate electronically. These four primary capabilities of the PC are vital to the needs of NASA's users and help to continue and support the vast amounts of work done by the NASA employees. Author

N89-20619*# Institute for Computer Applications in Science and Engineering, Hampton, VA.
CUMULATIVE REPORTS AND PUBLICATIONS THROUGH DECEMBER 31, 1988 Final Report
Feb. 1989 64 p Prepared in cooperation with NASA, Langley Research Center, Hampton, VA
(Contract NAS1-18107; NAS1-18605)
(NASA-CR-181784; NAS 1.26:181784) Avail: NTIS HC A04/MF A01 CSCL 12/1

This document contains a complete list of ICASE Reports. Since ICASE Reports are intended to be preprints of articles that will appear in journals or conference proceedings, the published reference is included when it is available. Author

N89-21711# Air War Coll., Maxwell AFB, AL.
NATIONAL SPACE POLICY
ERNEST B. SUTTON May 1988 93 p
(AD-A202644; AD-E900870) Avail: NTIS HC A05/MF A01 CSCL 22/1

National space policy forms the foundation for decisions and direction of the United States national space program. This review begins with the Eisenhower era and the launching of Sputnik 1, considered by most as the start of the space race with the Soviet Union for national space preeminence. Succeeding administrations are discussed to provide the historical setting affecting the actions of presidents, leaders within NASA, the DOD, and Congress as well as other players in the national space arena. This review analyzes the latest national space policy, established by President Reagan in February, 1988. Finally, specific space development programs are offered as topics which will demand the attention of future administrations. GRA

N89-22354# Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
DEVELOPMENT OF A DBASE III PLUS DATABASE FOR OFFICE AUTOMATION WITHIN THE DEPARTMENT OF LOGISTICS MANAGEMENT, SCHOOL OF SYSTEMS AND LOGISTICS M.S. Thesis
JOHN H. BARNES Sep. 1988 119 p
(AD-A202628; AD-E900870; AFIT/GLM/LSM/88S-2) Avail: NTIS HC A06/MF A01 CSCL 12/5

The purpose of this thesis was to program a database system written in dBase III Plus for use in AFIT/LSM. The system was to be hosted on a personal computer so that it could be transportable between the different computers in the office and conveniently used by as many personnel as possible. The program was intended to replace as much manual paperwork as possible and to provide a means to quickly access, sort, and to efficiently answer queries regarding the department faculty. The final result was intended to automate the routine office functions. This automation would relieve the department personnel from mundane duties so that they could concentrate their time on more productive pursuits. The product of these efforts was the Integrated Faculty Information System (IFIS). The IFIS is a menu driven system that utilizes 19 databases that are interrelated to form one large database system. The database system has the capability to contain all the vital professional and demographic information on each member of the staff. The IFIS provides a means to input all the appropriate information and to modify preexisting information within the database system. GRA

N89-22527# Department of Energy, Washington, DC.
INFORMATION TECHNOLOGY RESOURCES LONG-RANGE PLAN: FY90 TO FY94
Dec. 1988 325 p
(DE89-007784; DOE/MA-0351) Avail: NTIS HC A14/MF A02

The principle objective of the Information Technology Resources Plan is to describe the information technology resources and capabilities of the Department, the future requirements, and the strategies and plans to satisfy the identified requirements. The long-range planning process provides the systematic means to meet this objective and assists the Department in assuring that information technology support is provided in an efficient, effective, and timely manner so that the programmatic missions can be accomplished. Another important objective of the Plan is to promote better understanding, both within and external to the Department, of its information technology environment, requirements, issues, and recommended solutions as well as a description of the Departmental unclassified computer security program. DOE

N89-22528# Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
PLANNING AND CONTROLLING THE ACQUISITION COSTS OF AIR FORCE INFORMATION SYSTEMS M.S. Thesis
THOMAS J. FALKOWSKI Dec. 1988 95 p
(AD-A204421; AFIT/GIR/LSY/88D-5) Avail: NTIS HC A05/MF A01 CSCL 12/7

The purpose of this thesis was to identify indicators that can be used to more efficiently control the acquisition costs of Air Force management information systems. Statistical analysis was performed on cost data collected from Cost/Schedule Status Reports from information systems acquired under Air Force

Logistics Command's Logistics Management Systems Modernization Program. Using regression analysis, an initial model was developed that showed the significance of various cost areas on contract performance. The model was then transformed and reduced, to include only those variables that added significantly to the prediction of contract performance. Based on the sample analyzed, the following cost areas were identified as key indicators of contract performance: Software, Test and Evaluation, Training, and Maintenance. Although the limited size of the sample data make the results inconclusive, the methodology presented here provides a means to identify potential indicators. The goal of this research was not to provide a definitive model that would help program managers to predict contractor performance. Instead, the goal was to establish procedures or motivation, for program managers to identify key control variables that can help them to manage their programs more efficiently in a time of austere budgets and restricted manpower availability. GRA

N89-23371# Horton (Forest W., Jr.), Washington, DC.
INFORMATION RESOURCES MANAGEMENT
FOREST W. HORTON, JR. *In* AGARD, The Organisation and Functions of Documentation and Information Centres in Defence and Aerospace Environments 5 p Mar. 1989
Copyright Avail: NTIS HC A06/MF A01

The transfer of scientific and technical information between and among nations poses increasing challenges because of: larger and larger volumes of data exchanged; the increasing variety of information interchange media; larger and larger numbers of intermediaries and end-users all along the information transfer chain; and increasing incompatibility of bibliographic and telecommunications formatting conventions. The emerging field of Information Resources Management (IRM) offers promise in helping to cope with these serious information exchanges. In particular, experiments in the U.S. Federal Government with a technique called information mapping, helps information managers identify, describe, inventory/survey, and control their total data, document, and literature flows and holdings, whether automated or manual, more completely. This approach of IRM, and the technique of information mapping, in several organizational contexts - one private (an Australian mineral and mining company), the other public (the U.S. Department of State) are introduced. Author

N89-27350# Edgerton, Germeshausen and Grier, Inc., Idaho Falls, ID.
ELECTRONIC INFORMATION DELIVERY AT THE JOB SITE
DONALD L. SCHURMAN and J. PETER KINCAID (Army Research Inst. for the Behavioral and Social Sciences, Orlando, FL.) 1988 5 p Presented at the IEEE International Conference on System Man and Cybernetics, Beijing, China, 1 Aug. 1988
(Contract DE-AC07-76ID-01570)
(DE89-009726; EGG-M-20887; CONF-8808208-1) Avail: NTIS HC A01/MF A01

The United States Department of Defense is actively investigating the usefulness of presenting procedural information for operation and maintenance of equipment on small, often hand-held, computers. The basic concept that is being explored is: the presentation of information that is necessary to job performance by means of computers rather than by means of text and drawings printed on paper. The Idaho National Engineering Laboratory (INEL) assisted the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) in performing a test and evaluation of a prototype device that was an instantiation of the electronic information delivery concept. The prototype device is called the Personal Electronic Aid to Maintenance (PEAM). The device was tested as a substitute for technical manuals when being used by U.S. Army mechanics in the repair of the fire control system of the M1 Abrams tank. This test and evaluation of the PEAM prototype revealed several general problems for the electronic delivery of information in terms of the human-computer interaction involved. It became clear, for example, that formatting and graphical standards that apply to paper manuals will not apply to electronically presented procedures. Another problem that appeared was the problem of losing one's place in a troubleshooting or other branching procedure. These and other problems are presented and suggestions are made for resolution of some, but not all, of these problems. DOE

N85-70762 Library of Congress, Washington, DC. Federal Library Committee.
EMERGING ISSUES ON MANAGING INFORMATION RESOURCES
N. E. GWINN 1984 14 p

N85-72768* National Aeronautics and Space Administration, Washington, DC.
INFORMATION PROCESSING RESOURCES MANAGEMENT
Apr. 1985 97 p
(NASA-TM-87468; NHB-2410.1D; NAS 1.15:87468) Avail: NTIS HC A05/MF A01

N85-74028# Coast Guard, Washington, DC. Office of Command, Control, and Communications.
U.S. COAST GUARD INFORMATION CENTER PLAN Final Report
F. N. SQUIRES Jan. 1984 19 p
(PB85-175644; DOT-SRP-84-6)

N86-71594# Office of Management and Budget, Washington, DC.
MANAGING FEDERAL INFORMATION RESOURCES: THIRD ANNUAL REPORT UNDER THE PAPERWORK REDUCTION ACT OF 1980
Jun. 1984 60 p
(PB84-228641; AR-3)

N87-70232 American Metric Council, Washington, DC.
GUIDELINES FOR METRIC TRANSITION OF SOFTWARE
Oct. 1985 23 p
(PB86-240215) Avail: NTIS

N89-70432* National Aeronautics and Space Administration, Washington, DC.
THE PAD IS BACK
DALE MYERS Oct. 1988 1 p Contained in NASA-SP-6101
Avail: NTIS

N89-70436* National Aeronautics and Space Administration, Washington, DC.
CONTROLLING RESOURCES IN THE APOLLO PROGRAM
C. THOMAS NEWMAN Oct. 1988 4 p Contained in NASA-SP-6101
Avail: NTIS

N89-70676* National Aeronautics and Space Administration, Washington, DC.
THE CRISIS IN SPACE AND EARTH SCIENCE: A TIME FOR A NEW COMMITMENT
Nov. 1986 98 p Original document contains color illustrations
(NASA-TM-101290; NAS 1.15:101290) Avail: NTIS

N89-71009*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
PEAK POWER COST REDUCTION GUIDEBOOK Final Report, May 1983 - Dec. 1985
M. K. SELCUK and W. A. EDMISTON 15 Dec. 1986 119 p
(Contract AF PROJ. 8336)
(NASA-CR-185020; NAS 1.15:185020; JPL-PUB-85-91; DEB-TR-86-03) Avail: NTIS

COMPUTERS, TELECOMMUNICATIONS, AND NETWORKS

For IRM, high technology presents a double challenge: information management must make use of the best hardware and software for the job; however, procurement and application of main frames, minis, PC's,and LAN's can be problematic. Here is some help on how to use and control these tools.

A84-41197* Maryland Univ., College Park.
INTERCONNECTING HETEROGENEOUS DATABASE MANAGEMENT SYSTEMS
V. D. GLIGOR (Maryland, University, College Park, MD) and G. L. LUCKENBAUGH Computer (ISSN 0018-9162), vol. 17, Jan. 1984, p. 33-43. Research supported by the National Bureau of Standards. refs
(Contract NAS5-27378)
Copyright

It is pointed out that there is still a great need for the development of improved communication between remote, heterogeneous database management systems (DBMS). Problems regarding the effective communication between distributed DBMSs are primarily related to significant differences between local data managers, local data models and representations, and local transaction managers. A system of interconnected DBMSs which exhibit such differences is called a network of distributed, heterogeneous DBMSs. In order to achieve effective interconnection of remote, heterogeneous DBMSs, the users must have uniform, integrated access to the different DBMs. The present investigation is mainly concerned with an analysis of the existing approaches to interconnecting heterogeneous DBMSs, taking into account four experimental DBMS projects. G.R.

A84-44325* Jet Propulsion Lab., California Inst. of Tech., Pasadena.
ALGORITHM 607 - TEXT EXCHANGE SYSTEM: A TRANSPORTABLE SYSTEM FOR MANAGEMENT AND EXCHANGE OF PROGRAMS AND OTHER TEXT
W. V. SNYDER (California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA) and R. J. HANSON (Sandia National Laboratories, Albuquerque, NM) ACM Transactions on Mathematical Software (ISSN 0098-3500), vol. 9, Dec. 1983, p. 427-440. NASA-supported research. refs
(Contract AT(29-1)-789)
Copyright

A85-14469
MULTI-LEVEL SECURITY FOR COMPUTER NETWORKING - SAC DIGITAL NETWORK APPROACH
W. GRIESS (USAF, Strategic Air Command, Offutt AFB, NE) and D. L. POUTRE (Mitre Corp., Bedford, MA) IN: EASCON '83; Proceedings of the Sixteenth Annual Electronics and Aerospace Conference and Exposition, Washington, DC, September 19-21, 1983. New York, Institute of Electrical and Electronics Engineers, 1983, p. 483-495. USAF-supported research. refs
Copyright

The functional features and architecture of the SACDIN (SAC digital network) are detailed. SACDIN is the new data transmission segment for directing SAC's strategic forces. The system has 135 processor nodes at 32 locations and processes, distributes and stores data of any level of security classification. The sophistication of access nodes is dependent on the location. A reference monitor mediates the multilevel security by implementation of the multi-state machine concept, i.e., the Bell-LaPadula model (1973, 1974), which concludes that a secure state can never lead to an unsecure state. The monitor is controlled by the internal access control mechanism, which resides in PROM. Details of the access process are provided, including message flow on trusted paths appropriate to the security clearance of the user. M.S.K.

A86-20668* Jet Propulsion Lab., California Inst. of Tech., Pasadena.
CONCEPTS FOR A GLOBAL RESOURCES INFORMATION SYSTEM
F. C. BILLINGSLEY and J. L. URENA (California Institute of Technology, Jet Propulsion Laboratory, Pasadena) IN: Spatial information technologies for remote sensing today and tomorrow; Proceedings of the Ninth Pecora Symposium, Sioux Falls, SD, October 2-4, 1984. Silver Spring, MD, Institute of Electrical and Electronics Engineers, Inc., 1984, p. 123-131. NASA-supported research. refs
Copyright

The objective of the Global Resources Information System (GRIS) is to establish an effective and efficient information management system to meet the data access requirements of NASA and NASA-related scientists conducting large-scale, multi-disciplinary, multi-mission scientific investigations. Using standard interfaces and operating guidelines, diverse data systems can be integrated to provide the capabilities to access and process multiple geographically dispersed data sets and to develop the necessary procedures and algorithms to derive global resource information. Author

A87-48606*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
SPACE STATION INFORMATION SYSTEM INTEGRATED COMMUNICATIONS CONCEPT
J. MURATORE, J. BIGHAM, V. WHITELAW, and W. MARKER (NASA, Johnson Space Center, Houston, TX) AIAA and NASA, International Symposium on Space Information Systems in the Space Station Era, Washington, DC, June 22, 23, 1987. 7 p.
(AIAA PAPER 87-2228) Copyright

This paper presents a model for integrated communications within the Space Station Information System (SSIS). The SSIS is generally defined as the integrated set of space and ground information systems and networks which will provide required data services to the Space Station flight crew, ground operations personnel, and customer communities. This model is based on the International Standards Organization (ISO) layered model for Open Systems Interconnection (OSI). The requirements used to develop the model are presented, and the various elements of the model described. Author

A87-48607*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
SPACE STATION INFORMATION SYSTEM REQUIREMENTS FOR INTEGRATED COMMUNICATIONS
W. MARKER (NASA, Johnson Space Center, Houston, TX), V. WHITELAW, J. MURATORE, and J. BIGHAM, JR. AIAA and NASA, International Symposium on Space Information Systems in the Space Station Era, Washington, DC, June 22, 23, 1987. 5 p.
(AIAA PAPER 87-2229) Copyright

Space Station Information System (SSIS) requirements for integrated end-to-end communications are presented. The SSIS is defined as the integrated set of space and ground data and information systems and networks which will provide required data services to the Space Station flight crew, ground operations personnel, and customer communities. This model is based on the International Standards Organization (ISO) layered model for Open System Interconnection (OSI). These SSIS requirements include grades of service, priority classifications, systems management, flow control, bandwidth allocation, and standard SSIS data services. Author

A88-18630#
INTEGRATED STRUCTURAL ANALYSIS FOR RAPID DESIGN SUPPORT
D. G. WONG and C. R. FULLER (Lockheed Missiles and Space Co., Inc., Sunnyvale, CA) (Structures, Structural Dynamics and Materials Conference, 27th, San Antonio, TX, May 19-21, 1986, Technical Papers. Part 1, p. 638-645) Journal of Spacecraft and Rockets (ISSN 0022-4650), vol. 24, Sept.-Oct. 1987, p. 416-422.

Previously cited in issue 18, p. 2657, Accession no. A86-38868. refs
Copyright

A88-20252* Jet Propulsion Lab., California Inst. of Tech., Pasadena.
DATA ACCESS FOR SCIENTIFIC PROBLEM SOLVING
JAMES W. BROWN (California Institute of Technology, Jet Propulsion Laboratory, Pasadena) IN: Problem solving environments for scientific computing. Amsterdam, North-Holland, 1987, p. 33-46. refs
Copyright

An essential ingredient in scientific work is data. In disciplines such as Oceanography, data sources are many and volumes are formidable. The full value of large stores of data cannot be realized unless careful thought is given to data access. JPL has developed the Pilot Ocean Data System to investigate techniques for archiving and accessing ocean data obtained from space. These include efficient storage and rapid retrieval of satellite data, an easy-to-use user interface, and a variety of output products which, taken together, permit researchers to extract and use data rapidly and conveniently. Author

A88-51934#
THE SPECIFICATION AND DESIGN OF A SYSTEM USING COMPUTER-AIDED SOFTWARE ENGINEERING AND PERFORMANCE ANALYSIS TOOLS
B. E. CLARK, JANET R. DUNHAM, and DEBORAH L. FRANKE (Research Triangle Institute, Research Triangle Park, NC) AIAA, AHS, and ASEE, Aircraft Design, Systems and Operations Meeting, Atlanta, GA, Sept. 7-9, 1988. 8 p. refs
(AIAA PAPER 88-4410) Copyright

The combined use of computer-aided software engineering (CASE) and architecture design and assessment system (ADAS) methods for designing complex digital systems such as a guidance and control system is considered. Both CASE and performance analysis tools provide the consistency checking which is necessary to ensure a correct specification, and CASE tools provide extensive documentation features such as data dictionaries and the automatic generation of MIL STD 2167 specifications. ADAS tools provide an event list for ensuring correct performance in a real-time system, along with mapping capabilities which allow hardware constraints to be included in the analysis. R.R.

A88-55015
SATELLITE INFORMATION SYSTEMS
EDWARD S. BINKOWSKI (Strategic Comaps, Inc.; Hunter College; Fordham University, New York) Boston, MA, G.K. Hall Publishers, 1988, 223 p. refs
Copyright

Commercial applications of satellite technology are discussed in a general overview for potential users. Chapters are devoted to satellite information systems (including one-to-one, one-to-many, and many-to-one information transfer), regulation and competition in satellite communications, and a survey of currently open questions for users and operators. Directories of relevant publications and associations are provided. T.K.

A89-12176
COPING WITH LEGACY FACTORS
D. L. BUNDY and J. A. WEISS (McDonnell Aircraft Co., Saint Louis, MO) Engineering with Computers (ISSN 0177-0667), vol. 4, no. 1-2, 1988, p. 11-17.
Copyright

Implementers of engineering data base management systems inherit a legacy of existing software and data that must be integrated into the new system with minimum disruption of ongoing activities. Some critical issues addressed here include changes in software engineering practices, impact on user training and procedures, and problems connected with traditional or parochial interests. The material covered describes some experiences in coping with these 'legacy factors' during the recent McDonnell Aircraft Company (MCAIR) integrated data base implementation. Author

A89-12177
DATA BASE SYSTEM CONSIDERATIONS IN ENGINEERING DESIGN
H. MINDLIN and S. H. SMITH (Battelle Columbus Laboratories, OH) Engineering with Computers (ISSN 0177-0667), vol. 4, no. 1-2, 1988, p. 19-26. refs
Copyright

Data requirements for a general structural design procedure, including general development and maintenance steps, are examined, and the objectives of a design/engineering data base are formulated. In particular, it is noted that the design process will generate analysis and testing data that must be incorporated into the data bases to assure timeliness and completeness needed for efficient design. Development of new, faster, and better computerized design/engineering methods will emphasize the requirements for these and other types of data bases and interfaces. V.L.

A89-12180* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE INTEGRATED ANALYSIS CAPABILITY (IAC LEVEL 2.0)
HAROLD P. FRISCH (NASA, Goddard Space Flight Center, Greenbelt, MD) and ROBERT G. VOS (Boeing Aerospace Co., Seattle, WA) Engineering with Computers (ISSN 0177-0667), vol. 4, no. 1-2, 1988, p. 53-63. refs
Copyright

The critical data management issues involved in the development of the integral analysis capability (IAC), Level 2, to support the design analysis and performance evaluation of large space structures, are examined. In particular, attention is given to the advantages and disadvantages of the formalized data base; merging of the matrix and relational data concepts; data types, query operators, and data handling; sequential versus direct-access files; local versus global data access; programming languages and host machines; and data flow techniques. The discussion also covers system architecture, recent system level enhancements, executive/user interface capabilities, and technology applications. V.L.

A89-12181
AN INTEGRATED DATA BASE MANAGEMENT SYSTEM FOR ENGINEERING APPLICATIONS BASED ON AN EXTENDED RELATIONAL MODEL
J. S. ARORA and S. MUKHOPADHYAY (Iowa, University, Iowa City) Engineering with Computers (ISSN 0177-0667), vol. 4, no. 1-2, 1988, p. 65-73. refs
(Contract AF-AFOSR-82-0322)
Copyright

Some general research issues involved in the design and implementation of a new integrated data base management system (DBMS) are examined. A generalized relational model is introduced to handle large matrices and tables encountered in many engineering applications. The model forms the basis for the design of the new DBMS MIDAS/GR (Management of Information for Design and Analysis of Systems/Generalized Relational model) system. The system supports run-time data management as well as data sharing among software components. Some details of the design and performance of the system are discussed, as are results of some applications. V.L.

A89-26248
DEVELOPMENTS IN INTERDISCIPLINARY SIMULATION AND DESIGN SOFTWARE FOR MECHANICAL SYSTEMS
BERNHARD DOPKER (Iowa, University, Iowa City) Engineering with Computers (ISSN 0177-0667), vol. 4, no. 4, 1988, p. 229-238. Research supported by the University of Iowa. refs
Copyright

The current status of CAE software tools for mechanical design is surveyed, with a focus on methods for integrating structural analysis; kinematic, dynamic, and control simulation; service-life prediction; sensitivity analysis; and design optimization. The basic features of advanced CAE systems are discussed, including system executives, application-program integration, support utilities, user

interfaces, data-base systems, and computer environments, and nine currently available interdisciplinary program packages are briefly characterized. T.K.

A89-39600
INFORMATION CAPACITY OF ASSOCIATIVE MEMORIES
ANTHONY KUH (Hawaii, University, Honolulu) and BRADLEY W. DICKINSON (Princeton University, NJ) IEEE Transactions on Information Theory (ISSN 0018-9448), vol. 35, Jan. 1989, p. 59-68. Research supported by the Pacific International Center for High Technology Research. refs
(Contract N00014-83-K-0577; NSF ECS-84-05460; NSF MIP-87-10868)
Copyright

Associative memory networks consisting of highly interconnected binary-valued cells have been used to model neural networks. Tight asymptotic bounds have been found for the information capacity of these networks. The authors derive the asymptotic information capacity of these networks using results from normal approximation theory and theorems about exchangeable random variables. I.E.

A89-48162#
BUILDING MAINTAINABLE LARGE SCALE SOFTWARE SYSTEMS - THE MEASURABLE BENEFITS OF CASE TECHNOLOGY
MARK C. FILTEAU (BDM International, Inc., Dayton, OH) AIAA and NASA, Symposium on the Maintainability of Aerospace Systems, Anaheim, CA, July 26, 27, 1989. 8 p.
(AIAA PAPER 89-5051) Copyright

A major information systems manufacturer has been engaged for three years in an effort to apply commercially available computer-aided software engineering (CASE) tools to enhance productivity and reduce documentation errors. Attention is given to the most ambitious phase of this undertaking, in which over 180 software designers employed CASE, desktop publishing hardware, and automated product-management tools in the design and implementation of over four million lines of COBOL code. Test and maintenance statistics indicate a 50-percent reduction in error rates and a 70-percent improvement in product reliability. O.C.

A89-48764
THE SOFTWARE FACTORY: A FOURTH GENERATION SOFTWARE ENGINEERING ENVIRONMENT
MICHAEL W. EVANS (Expertware, Inc., Morgan Hill, CA) New York, Wiley-Interscience, 1989, 332 p. refs
Copyright

The software-development process and its management are examined in a text intended for engineering managers and students of computer science. A unified concept based on the principle that software design is an engineering science rather than an art is applied, and a software engineering environment (SEE) analogous to an industrial plant is proposed. Chapters are devoted to the classical software environment, the history of software engineering, the evolution of the SEE, the fourth-generation SEE, the engineering process, software-data relationships, the SEE data base, data control in the SEE, software life cycles, information-system product assurance, business management and control, and automating and adapting the SEE. T.K.

N84-14067# Lawrence Livermore National Lab., CA. Technology Information System.
TIS: AN INTELLIGENT GATEWAY COMPUTER FOR INFORMATION AND MODELING NETWORKS. OVERVIEW
V. E. HAMPEL, C. BAILEY, R. A. KAWAIN, N. A. LANN, S. K. MCGROGAN, W. S. SCOTT, S. M. STAMMERS, and J. L. THOMAS Aug. 1983 10 p refs
(Contract W-7405-ENG-48)
(DE83-017986; UCRL-53439; AD-A135916) Avail: NTIS HC A02/MF A01

The Technology Information System (TIS) is being used to develop software for Intelligent Gateway Computers (IGC) suitable for the prototyping of advanced, integrated information networks. Dedicated to information management, TIS leads the user to available information resources, on TIS or elsewhere, by means of a master directory and automated access procedures. Other geographically distributed information centers accessible through TIS include federal and commercial systems like DOE/RECON, NASA/RECON, DOD/DROLS, DOT/TIC, CIS, and DIALOG in the United States, the chemical information systems DARC in France, and DECHEMA in West Germany. New centers are added as required. DOE

N84-19163# Purdue Univ., West Lafayette, IN. Dept. of Electrical Engineering.
VLSI ARCHITECTURES FOR PATTERN ANALYSIS AND IMAGE DATABASE MANAGEMENT
K. HWANG *In* University of Southern California Proc. of USC Workshop on VLSI and Mod. Signal Process. p 174-184 15 Nov. 1983 refs
Avail: NTIS HC A11/MF A02 CSCL 09/2

VLSI computing structures are introduced for the analysis and management of imagery data. It is argued that machine intelligence would be greatly enhanced if new generation of computers could be designed to process multidimensional imagery data above the string processing of alphanumerical information by present computers. Practical applications of computers include the processing of biomedical images for diagnosis, the recognition of characters, fingerprints, and moving objects, remote sensing, industrial inspection, robotic vision, military intelligence, and data compression for communications. Image analysis refers to the use of digital computers for Pattern Recognition and Image Processing (PRIP). On-line imagery data needs to be restored on disks and fastly retrieved for PRIP applications. A VLSI based image analysis machine should integrate both pattern analysis and image data base management capabilities into a unified system design. E.A.K.

N84-20840# Lister Hill National Center for Biomedical Communications, Bethesda, MD.
VIDEODISC PREMASTERING FACILITY: TECHNICAL EVALUATION Report, 1982 - 1983
G. THOMA, R. GRIER, S. MERRIAM, and W. LEONARD Sep. 1983 153 p refs
(PB84-135821; LHNCBC/TR-83-10) Avail: NTIS HC A08/MF A01 CSCL 14/2

It is widely recognized that the videodisc has the potential to improve productivity in areas such as information transfer and education. Apart from simply serving as a linear playback medium for home entertainment, the videodisc is finding applications as an interactive medium for information, instruction, and as a visual database. This report describes a facility developed to perform the premastering functions for a Level Two disc, the results of a technical evaluation of this facility, and the level-of-effort and costs associated with the development of the experimental interactive videodisc. Author (GRA)

N84-21426# Oak Ridge National Lab., TN. Computer Sciences.
OPEN SYSTEMS INTERCONNECTION FOR THE DEFENCE COMMUNITY
N. B. GOVE *In* AGARD The Appl. of New Technol. to Improve the Delivery of Aerospace and Defence Inform. 5 p Dec. 1983 refs
Copyright Avail: NTIS HC A06/MF A01

The area of Open Systems Interconnection is a very active area. The concept of a layered approach to communication standards is generally accepted and the OSI Reference Model appears to be successful as a working aproach toward integration of the many standards involved in open connection. The Reference Model is not in itself a communication standard but rather a framework for standards development. As such, it will permit evolution of standards as needed in a changing technology, while providing a coherent approach to the many problems involved in Open Systems interconnection. Author

N84-27453# Naval Postgraduate School, Monterey, CA.
THE IMPLEMENTATION OF A MULTI-BACKEND DATABASE SYSTEM (MDBS). PART 4: THE REVISED CONCURRENCY CONTROL AND DIRECTORY MANAGEMENT PROCESSES AND THE REVISED DEFINITIONS OF INTER-PROCESS AND INTER-COMPUTER MESSAGES
S. A. DEMURJIAN, D. K. HSIAO, D. S. KERR, and A. OROOJI Feb. 1984 30 p
(AD-A140874; AD-E500637; NPS52-84-005) Avail: NTIS HC A03/MF A01 CSCL 09/2

The multi-backend database system (MDBS) uses one minicomputer as the master or controller, and a varying number of minicomputers and their disks as slaves or backends. MDBS is primarily designed to provide for database growth and performance enhancement by the addition of identical backends. No special hardware is required. The backends are configured in a parallel manner. A new backend may be added by replicating the existing software on the new backend. No new programming or reprogramming is required. A prototype MDBS is being completed in order to carry out the design verification and performance evaluation. This report is the fourth in a series which describes the MDBS implementation. The processes in the MDBS controller (request preparation, insert information generation and post processing) and the processes in the MDBS backends (directory management, record processing and concurrency control) have been described in the previous reports. The concurrency control process, formerly used to control access to just user data, is modified to control access to directory data as well. The directory management process is also modified to improve the execution of update requests. Finally, a directory management is modified for the storage of directory data on the secondary storage. Next, the report describes the revised definitions of inter-process messages (messages between processes within a minicomputer) and intercomputer messages (messages between processes in different minicomputers). Finally, we conclude this series of reports dealing with the implementation of MDBS. GRA

N84-27602# Price Waterhouse and Co., Washington, DC. Office of Government Services.
REPORT ON U.S. DOMESTIC AND INTERNATIONAL TELECOMMUNICATIONS AND INFORMATION MARKETS Final Report
Feb. 1984 204 p refs Sponsored by NTIA
(PB84-166362) Avail: NTIS HC A10/MF A02 CSCL 05/3

Contents: the U.S. telecommunications equipment market, 1970-82; the data processing equipment market, 1970-82; U.S. licensing and regulation of exports and imports of telecommunications and information equipment; U.S. Government procurement policies for telecommunications and information equipment; market for U.S. firms in telecommunications services; U.S. information services industry, 1970-82; new telecommunications and information services currently available or under development; Identification of the market for remote sensing by satellites; selected users of and benefits from telecommunications and information services. GRA

N84-33063# Air Command and Staff Coll., Maxwell AFB, AL.
IBM'S TOKEN-RING LAN (LOCAL-AREA NETWORK): A BASE-LEVEL COMMUNICATIONS SOLUTION Student Report
J. D. WELLS Apr. 1984 42 p
(AD-A143446; ACSC-84-2765) Avail: NTIS HC A03/MF A01 CSCL 09/2

This document reviews the computer revolution and information explosion within the Air Force and their part in increased data communications requirements. It investigates the local-area network topologies for capabilities and characteristics that are advantageous in a CONUS, non-secure, base-level configuration. Focused upon are the bus and ring topologies. Then a closer examination is made of a hybrid star-ring local area network (LAN) utilizing a token-access control mechanism. This LAN, as proposed by IBM, is seen to have superior maintainability, reliability, and flexibility. Author (GRA)

N84-34316# Air Command and Staff Coll., Maxwell AFB, AL.
MANAGING MICROCOMPUTERS: A SURVIVAL KIT FOR FUNCTIONAL MANAGERS
E. C. IVERSTINE Apr. 1984 20 p
(AD-A144006; AD-E751074; ACSC-84-1345) Avail: NTIS HC A03/MF A01 CSCL 05/1

Military and civilian use of microcomputers has expanded at a phenomenal rate. Their popularity stems form the fact that they put computational power in the hands of users. But this capability presents new challenges to functional managers in the military community because they now must manage their computational tools (microcomputers) as well as their work units. This article defines the microcomputer management environment facing functional managers and outlines some principles for meeting this challenge. Author (GRA)

N84-34326# Naval Postgraduate School, Monterey, CA.
THE CREATION OF A CENTRAL DATABASE ON A MICROCOMPUTER NETWORK M.S. Thesis
J. G. BOYNTON and R. G. NICHOLS Mar. 1984 219 p
(AD-A143875) Avail: NTIS HC A10/MF A02 CSCL 09/2

This thesis discusses the design and development of a central database on a network of microcomputers. It provides an overview of the methodology utilized in creating the system, along with the problems associated with a central database. The thesis includes the source listings for the creation of the system and a discussion of the difficulties of controlling contention within the networked database environment. Author (GRA)

N84-34381*# National Aeronautics and Space Administration, Washington, DC.
NETWORKING
In its Planetary Data Workshop, Pt. 2 p 189-214 Oct. 1984
Avail: NTIS HC A07/MF A01 CSCL 03/2

Data exchange and communication between users, between nodes, and between users and nodes within the Planetary Data System are discussed. Data transport costs, methods, and protocol are reviewed. R.S.F.

N85-12777# Office of Management and Budget, Washington, DC.
FIVE-YEAR PLAN FOR MEETING THE AUTOMATIC DATA PROCESSING AND TELECOMMUNICATIONS NEEDS OF THE FEDERAL GOVERNMENT. VOLUME 1: PLANNING STRATEGIES Final Report
May 1984 83 p Prepared in cooperation with GSA, Washington, D.C., and Commerce Dept., Washington, D.C. 2 Vol.
(PB84-214501) Avail: NTIS HC A05/MF A01 CSCL 05/1

The first volume, A Five-Year Plan for Meeting the Automatic Data Processing and Telecommunications Needs of the Federal Government: Planning Strategies, describes the planning process and examines the planning effort of several typical agencies. It also provides a survey of the current state of planning among the cabinet agencies and explores some of the issues involved in managing the evolution of the new technology. GRA

N85-12778# Office of Management and Budget, Washington, DC.
FIVE-YEAR PLAN FOR MEETING THE AUTOMATIC DATA PROCESSING AND TELECOMMUNICATIONS NEEDS OF THE FEDERAL GOVERNMENT. VOLUME 2: MAJOR INFORMATION TECHNOLOGY SYSTEMS ACQUISITION PLANS OF FEDERAL EXECUTIVE AGENCIES, 1984-1989 Final Report
May 1984 380 p Prepared in cooperation with GSA, Washington, D.C. and Commerce Dept., Washington, D.C. 2 Vol.
(PB84-214519) Avail: NTIS HC A17/MF A02 CSCL 05/1

This is the second of two volumes. Volume 2 contains the information technology acquisition plans of the Federal Government, broken out by agency and component. Volume 2 is arranged into three major sections. Section 1 contains an analysis of major information technology acquisitions by Federal executive

agencies. Section 2 is the compilation of planned executive agency information technology procurement obtained from the 1985 Federal budget. Section 3 is an agency index. GRA

N85-16481# Naval Postgraduate School, Monterey, CA.
FUTURE DATABASE MACHINE ARCHITECTURES
D. K. HSIAO Sep. 1984 14 p
(AD-A146786; NPS52-84-014) Avail: NTIS HC A03/MF A01 CSCL 09/2

There are many software database management systems available on many general-purpose computers ranging from micros to super-mainframes. Database machines as backend computers can offload the database management work from the mainframe so that we can retain the same mainframe longer. However, the database backend must also demonstrate lower cost, higher performance, and newer functionality. Some of the fundamental architecture issues in the design of high-performance and great-capacity database machines are addressed. Solutions towards resolving these design issues are articulated. This article is written for the New York University's Symposium in New Directions of Database Systems on the basis of a lecture given at Microelectronic and Computer Technology, Inc. (MCC). GRA

N85-24198*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, AL.
INTRODUCTION TO THE SPACE PHYSICS ANALYSIS NETWORK (SPAN)
J. L. GREEN, ed. and D. J. PETERS, ed. (Alabama Univ., Huntsville) Apr. 1985 38 p refs
(NASA-TM-86499; NAS 1.15:86499) Avail: NTIS HC A03/MF A01 CSCL 17/2

The Space Physics Analysis Network or SPAN is emerging as a viable method for solving an immediate communication problem for the space scientist. SPAN provides low-rate communication capability with co-investigators and colleagues, and access to space science data bases and computational facilities. The SPAN utilizes up-to-date hardware and software for computer-to-computer communications allowing binary file transfer and remote log-on capability to over 25 nationwide space science computer systems. SPAN is not discipline or mission dependent with participation from scientists in such fields as magnetospheric, ionospheric, planetary, and solar physics. Basic information on the network and its use are provided. It is anticipated that SPAN will grow rapidly over the next few years, not only from the standpoint of more network nodes, but as scientists become more proficient in the use of telescience, more capability will be needed to satisfy the demands. Author

N85-26170# Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Engineering.
DEVELOPMENT OF A USER SUPPORT PACKAGE FOR CPESIM 2 (A COMPUTER SIMULATION FOR CPE (COMPUTER PERFORMANCE EVALUATION) USE M.S. Thesis
D. L. PETTY Dec. 1984 159 p
(AD-A151899; AFIT/GCS/ENG/84D-21) Avail: NTIS HC A08/MF A01 CSCL 09/2

In 1983 a SLAM computer simulation was developed to be used as an educational tool in computer performance evaluation (CPE) and Queueing Theory classes at AFIT. Lack of user friendliness and additional requirements necessitated the development of a user friendly interface, i.e. this thesis effort. The interface consists of two programs: one for the instructor and one for his students. The students' interface allows them to modify and display the initial or subsequently modified computer configurations and to do a data reduction and histogram analysis on output software monitor data after a simulation run. Any student configuration changes are stored in an Ingres database. The instructor's interface allows him to easily create initial configuration, the cataloog of available hardware, and the system's workload of one to ten jobstreams. He can also display any or all configurations of any or all student teams on his terminal or direct that display to a file for later printing. The interface as a whole is menu-driven, user friendly, and very portable; it operates on any UNIX system (which has Ingres and SLAM) regardless of the hardware (including terminals) that the operating system is implemented on. A student and instructor user's manual is provided. GRA

N85-26173# National Bureau of Standards, Washington, DC.
FUTURE INFORMATION TECHNOLOGY, 1984 TELECOMMUNICATIONS Final Report
P. KAY and P. POWELL Dec. 1984 343 p refs Prepared in cooperation with Little (Arthur D.), Inc., Aurora Associates, Inc., Titan Systems, Inc. and International Data Corp.
(PB85-165850; NBS/SP-500/119; LC-84-601149) Avail: NTIS HC A15/MF A02; also available SOD HC $9.50 as SN003-003-02626-3 CSCL 09/2

Telecommunications technology and related areas in computer organization are discussed. Four primary concerns are mentioned: the telecommunications forecast, through 1999, three perspectives on the divestiture of AT&T, a discussion of the general impacts of technology on computer security, and the management implications of the trends in information technology. Additionally, the summary of an industry workshop on this forecast, a brief update of the 1983 forecast, and a glossary of terms are presented. GRA

N85-27106*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
NETWORK INFORMATION MANAGEMENT SUBSYSTEM
C. C. CHATBURN *In its* The Telecommun. Data Acquisition Rept. p 109-115 15 May 1985 refs
Avail: NTIS HC A08/MF A01 CSCL 05/1

The Deep Space Network is implementing a distributed data base management system in which the data are shared among several applications and the host machines are not totally dedicated to a particular application. Since the data and resources are to be shared, the equipment must be operated carefully so that the resources are shared equitably. The current status of the project is discussed and policies, roles, and guidelines are recommended for the organizations involved in the project. Author

N85-27572# Lawrence Livermore National Lab., CA. Technical Information System.
INTERNATION INFORMATION NETWORKS FOR MATERIAL PROPERTIES: REVISION 1
V. E. HAMPEL, C. A. GAYNOR, B. E. HEGEMANN, R. D. SANNER, and Y. WOLMAN (Hebrew Univ. of Jerusalem) Jun. 1984 55 p refs Presented at the 9th Intern. CODATA Conf., Jerusalem 24-28 Jun. 1984
(Contract W-7405-ENG-48)
(DE85-007412; UCRL-90941-REV-1; CONF-8406139-9-REV-1)
Avail: NTIS HC A04/MF A01

Available S and T resources from three continents were demonstrated. Interactive retrievals of physical and chemical data derived from seven online information systems were renewed and corresponding explanations were measured for: CAS ONLINE and NBS/OSRD in the US, CRYSTMET and F*A*C*T in Canada, DARC in France, DECHEMA in West Germany, and FMDB in Japan. This audio-visual demonstration was carried out over international packet-switching networks and regular telephone voice communications. The machine-aided translation of a sample of its French text into English from Los Angeles, was demonstrated within the hour. DOE

N85-27762# National Bureau of Standards, Gaithersburg, MD. Inst. for Computer Sciences and Technology.
FUTURE INFORMATION TECHNOLOGY, 1984: TELECOMMUNICATIONS
P. KAY, ed. and P. POWELL, ed. Dec. 1984 334 p refs Sponsored in part by IRS and Office of the Secretary of Defense Prepared in cooperation with Little (Arthur D.) Inc., Aurora Associates, Inc., Titan Systems, Inc., and International Data Corp.
(NBS/SP-500/119; T185-901186; LC-84-601149) Avail: NTIS HC A15/MF A02

Telecommunications technology and related areas in computer organizations are considered. Topics covered includes: the

telecommunications forecast through 1999, three perspectives on the divestiture of AT&T, a general impacts of technology on computer security, and the management implications of the trends in information technology. An industry workshop on this forecast is summarized and the 1983 forecast is updated. A glossary of terms is included. A.R.H.

N86-15209*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
GUIDELINES FOR SUBMITTING DATA TO THE NATIONAL SPACE SCIENCE DATA CENTER
Jul. 1984 7 p
(NASA-TM-87500; NSSDC/WDC-A-RS-84-19; NAS 1.15:87500)
Avail: NTIS HC A02/MF A01 CSCL 05/2

The mission of the National Space Science Data Center (NSSDC) is to disseminate space science data for further analysis beyond that provided by the principal investigators (PIs) or team leaders (TLs) and their coworkers. Consequently, the NSSDC is responsible for the acquisition, organization, storage, retrieval, announcement, and distribution of scientific data obtained mainly from satellites and spacecraft. Any scientist may acquired data from the NSSDC and use them in further studies, either alone or in conjunction with data from ground-based or spacecraft experiments. With the responsibility for archiving data is the concomitant responsibility for distributing the documentation necessary to make those data usable. Since the group most knowledgeable about a particular experiment and its data is the PI or TL and his coworkers, and since the NSSDC cannot possibly supply the qualified personnel needed to write this documentation comprehensively, it is the responsibility of the PI or TL to provide the essential documentation. The NSSDC will support this effort by defining what is needed, by reviewing what is provided, and by reproducing and distributing the resulting documentation with the data. For a high-use data set, the NSSDC may publish the documentation as a Data Users Note; for a low-use data set, the NSSDC may distribute a Xerox, microfilm, or microfiche copy of the documentation. Author

N86-16159# Los Alamos National Lab., NM.
LOGICAL AND PHYSICAL DATABASE DESIGN WITH A FULL-TEXT ENVIRONMENT
C. D. MICHELSEN and D. F. SHAFER 1985 11 p Presented at the 2nd IEEE International Conference on Data Engineering, Los Angeles, California, 4 Feb. 1985
(Contract W-7405-ENG-36)
(DE85-015683; LA-UR-85-2329; CONF-850295-1) Avail: NTIS HC A03/MF A01

This paper describes the problems and solutions encountered in the design of logical and physical data bases within a full-text environment. A full-text environment can be defined as data bases that store both citation information as well as actual document text. The problems/solutions encountered were a result of the necessity to integrate distinct physical data bases into a single logical data base without the assistance of a data base management system that is capable of physical data base integration. DOE

N86-20473*# McDonnell-Douglas Astronautics Co., Huntington Beach, CA.
SPACE STATION DATA SYSTEM ANALYSIS/ARCHITECTURE STUDY. TASK 1: FUNCTIONAL REQUIREMENTS DEFINITION, DR-5
Dec. 1985 308 p refs
(Contract NAS5-28082)
(NASA-CR-177838; NAS 1.26:177838; MDC-H1343A-REV) Avail: NTIS HC A14/MF A02 CSCL 22/2

The initial task in the Space Station Data System (SSDS) Analysis/Architecture Study is the definition of the functional and key performance requirements for the SSDS. The SSDS is the set of hardware and software, both on the ground and in space, that provides the basic data management services for Space Station customers and systems. The primary purpose of the requirements development activity was to provide a coordinated, documented requirements set as a basis for the system definition of the SSDS and for other subsequent study activities. These requirements should also prove useful to other Space Station activities in that they provide an indication of the scope of the information services and systems that will be needed in the Space Station program. The major results of the requirements development task are as follows: (1) identification of a conceptual topology and architecture for the end-to-end Space Station Information Systems (SSIS); (2) development of a complete set of functional requirements and design drivers for the SSIS; (3) development of functional requirements and key performance requirements for the Space Station Data System (SSDS); and (4) definition of an operating concept for the SSIS. The operating concept was developed both from a Space Station payload customer and operator perspective in order to allow a requirements practicality assessment. M.G.

N86-25133# Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Engineering.
CONTENT-ADDRESSABLE MEMORY MANAGER: DESIGN AND EVALUATION M.S. Thesis
M. C. ROWE Dec. 1985 355 p refs
(AD-A164037; AFIT/GE/ENG/85D-36) Avail: NTIS HC A16/MF A02 CSCL 09/2

This research covers basic issues in implementing a Content-Addressable Memory (CAM) for a microcomputer. The thesis compares the various types of CAM organizations and presents a set of standards to distinguish true CAM from CAM-like memory. Issues such as the meaning of content to the host computer are discussed. This discussion leads to the implementation issues of how the CAM should operate with the host computer. The two configurations addressed in detail: a completely integrated approach and a peripheral approach. The thesis does not address the associative processor configurations found in PEPE, STARAN, or MPP. The case is presented that the peripheral device approach is the most practical approach. The peripheral device, CAM board, using the AFIT CAM IC chips, will be controlled from a dedicated device that is designed and evaluated in this thesis. The architecture and operation of the CAM IC chip controller (CAM Manager) is derived from the desire to have a general purpose device that will have a small instruction set. The instructions will allow for efficient operations on applications as diverse as LISP garbage collection, database searching, and array arithmetic. This thesis compares a conventional computer executing the test applications and the same computer using the CAM board. The test applications were: (1) addition over all elements of an array, (2) LISP garbage collection, and (3) image recognition. The CAM board can enhance the performance of the host microcomputer. GRA

N86-25687# RAND Corp., Santa Monica, CA.
TELECOMMUNICATIONS ALTERNATIVES FOR FEDERAL USERS: MARKET TRENDS AND DECISIONMAKING CRITERIA
L. L. JOHNSON, M. A. SIRBU, and B. M. MITCHELL Dec. 1985 237 p refs Sponsored by NSF
(Contract NSF PRA-84-00689)
(PB86-153764; R-3355-NSF; ISBN-0-8330-0692-4; NSF/PRA-85023) Avail: NTIS HC A11/MF A02 CSCL 17/2

The telecommunications market has been marked by growing competition in local and long-distance transmission and in terminal equipment. In response to this, the goal of the study is to show what kinds of information government agencies should collect, and how they should use it, to improve decision making. The study considers four objectives: (1) to identify and assess options for meeting voice and data needs, taking into account technical, economic, and regulatory constraints; (2) to show how Federal agencies can evaluate their needs in light of the options for supplying them; (3) to establish criteria for evaluating the relative merits of options in light of these needs; and (4) to construct a decision making framework for choosing among options, taking into account uncertainties about costs, performance, and benefits. Author (GRA)

N86-26924# Naval Postgraduate School, Monterey, CA.
MODERN HARDWARE TECHNOLOGIES AND SOFTWARE TECHNIQUES FOR ON-LINE DATABASE STORAGE AND ACCESS M.S. Thesis
C. V. FEUDO Dec. 1985 297 p refs
(AD-A164993) Avail: NTIS HC A13/MF A02 CSCL 09/2

Computerized data processing applications have grown over the past thirty years to a point where they have now become a pervasive influence in our society. As the range of applications has grown, a continuing concern has been the cost and access time of data storage. A wide range of technologies have been investigated to address this problem. The purpose of this thesis is to examine high volume, on-line storage media of current and emerging technologies and software techniques for supporting these on-line, high capacity storage media. In the first part, we analyze such media as vertical magnetic recording, thin film media, optical data disks, magneto-optic disks, bubble and Bernoulli-effect disks. Then, comparisons and evaluations of products and product categories are illustrated. In the second part, we review the modern software techniques for on-line database storage and access.
Author (GRA)

N86-29285*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
DATA SET MANAGEMENT
M. REPH *In its* Proceedings of the Second Pilot Climate Data System Workshop 17 p 1986
Avail: NTIS HC A12/MF A02 CSCL 04/2

The data sets currently supported by the Pilot Climate Data System (PCDS) are listed, many of which are Level II and Level III Nimbus-7 data sets. Those data sets planned for future access through the PCDS were also listed, and their current installation status was stated. The tasks involved in supporting data sets within the PCDS were identified and described. After a data set is approved for implementation into the system and communication with the data producers is established, the information for the detailed catalog entry is gathered. This information then is reviewed with the scientists involved before producing a catalog summary. Once this is done, the catalog information can be provided to users, even before the data set is installed. The next several tasks involve software development and can prove to be the most time-consuming aspect in the data set support. These tasks can be simplified if the data producers provide complete and accurate documentation of their product. Software for reading and interpreting the data sets is developed and the data sets, or portions therefore, that will be made available for use within the PCDS are inventoried. Users can access this information via the INVENTORY Subsystem of the PCDS.
Author

N86-29297*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
NETWORK ACCESS TO PCDS (SPAN, ESN, SESNET, ARPANET)
J. GREEN *In its* Proceedings of the Second Pilot Climate Data System Workshop 29 p 1986
Avail: NTIS HC A12/MF A02 CSCL 04/2

One of the major goals of the National Space Science Data Center is to increase access to NASA data systems by enhancing networking activities. The activities are centered around three basic networking systems: the Space Physics Analysis Network (SPAN); the Earth Science Network (ESN); and the NASA Packet Switched System (NPSS). Each system is described, linkages among systems are explained, and future plans are announced. The inclusion of several new climate nodes on SPAN or ESN are also mentioned. Presently, the Pilot Climate Data System is accessible through SPAN and will be accessible through NPSS by summer and ESN by the end of 1986. Ambitious plans for implementation are underway. The implementation of these plans will represent a major advance in the utilization and accessibility of data worldwide.
Author

N86-29298*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
METHODS OF DOWNLOADING TO USER INSTITUTIONS
L. TREINISH *In its* Proceedings of the Second Pilot Climate Data System Workshop 10 p 1986
Avail: NTIS HC A12/MF A02 CSCL 04/2

The Pilot Climate Data System (PCDS) not only supports the ability to output data in a uniform structure via the Common Data Format (CDF, but also supports the ability to provide data in native format for any data set supported by the PCDS. Methods are discussed for acquiring data in either format from the PCDS for further work at remote sites. Four levels of remote utilization are defined, based on the extent of offloading the National Space Science Data Center (NSSDC) computer and local PCDS processing. Characteristics of each level are thoroughly explained, including details of information and data transfers, downloading, uploading, and offloading of the NSSDC computer. Only the levels themselves are specified here. The first level defined is that of a network-based distributed PCDS. A subset of the PCDS software is ported to another VAX and made available on a network (i.e., SPAN) node. There is no subset of the PCDS at the second level, but it is also network based. Non-network utilization of the PCDS, requiring dial-up log on, is denoted as a third level. Finally, at the fourth level, personal computer utilization of the PCDS through dial-up log on with proper terminal emulation is defined.
Author

N86-33208*# National Aeronautics and Space Administration, Washington, DC.
PROTOTYPE MATERIAL PROPERTIES DATA NETWORK
C. J. M. NORTHRUP, JR. (Sandia National Labs., Albuquerque, N. Mex.), J. L. MCCARTHY (California Univ., Berkeley. Lawrence Berkeley Lab.), J. H. WESTBROOK (Sci-Tech Knowledge Systems, Scotia, N.Y.), and W. GRATTIDGE 1986 10 p Presented at the ASME Pressure Vessel and Piping Conference and Exhibit, Chicago, Ill., 20 Jul. 1986 Sponsored by NASA
(Contract DE-AC04-76DP-00789)
(NASA-TM-89243; NAS 1.15:89243; DE86-007821; SAND-86-0499C; CONF-860722-7) Avail: NTIS HC A02/MF A01 CSCL 05/2

The Scientific Information Research Program (SIRP) is a cooperative program initiated by the National Bureau of Standards and the Department of Energy to develop a prototype, computerized information network. Subsequent support has been provided by the National Aeronautical and Space Administration and the Department of Defense. A group of engineers and scientists were selected from Lawrence Livermore National Laboratory, Los Alamos National Laboratory and Sandia National Laboratories to form an initial user group and provide guidance in the development of the system. After an intensive analysis, it was determined that the information the Group used most frequently was the physical properties of metal alloys. This data is the focus for the database system, Materials Information for Science and Technology (MIST), being developed for the network.
DOE

N87-16381*# Science Applications International Corp., Washington, DC.
EARTH AND ENVIRONMENTAL SCIENCE IN THE 1980'S: PART 1: ENVIRONMENTAL DATA SYSTEMS, SUPERCOMPUTER FACILITIES AND NETWORKS
Washington NASA Oct. 1986 431 p
(Contract NASW-3622; NASW-4092; SAIC PROJ. 1-224-03-340-28)
(NASA-CR-4029; NAS 1.26:4029) Avail: NTIS HC A19/MF A03 CSCL 08/5

Overview descriptions of on-line environmental data systems, supercomputer facilities, and networks are presented. Each description addresses the concepts of content, capability, and user access relevant to the point of view of potential utilization by the Earth and environmental science community. The information on similar systems or facilities is presented in parallel fashion to encourage and facilitate intercomparison. In addition, summary

sheets are given for each description, and a summary table precedes each section. Author

N87-16658# Defense Technical Information Center, Alexandria, VA. Office of Information Systems and Technology.
THE DOD GATEWAY INFORMATION SYSTEM DIRECTORY OF RESOURCES Final Report
CAROL E. JACOBSON and GLADYS A. COTTER Aug. 1986 15 p
(AD-A174154; DTIC/TR-86/8) Avail: NTIS HC A03/MF A01 CSCL 05/2

The Defense Technical Information Center (DTIC) is sponsoring development of a DoD Gateway Information System (DGIS) to provide online, streamlined methods for identifying, accessing, searching and analyzing data from heterogeneous databases of interest to the DOD community. At the core of the gateway system is a Directory of Resources which contains information on the content, scope and availability of selected databases. Presently, the Directory references over 430 DOD-sponsored R&D databases, but this figure is expected to grow to over 3,000 when coverage is expanded to include additional DOD, other federal, and commercial databases. The prototype Directory runs on a VAX 11/780 minicomputer using the INGRES database management system and is available to a select community of users for test and evaluation. A critical feature is the menu-driven interface designed to assist end-users. This paper describes data collection, database design, implementation of the Directory and menu-driven interface, and future directions. GRA

N87-18282# Brookhaven National Lab., Upton, NY.
ACQUISITION, USE AND ARCHIVING OF REAL-TIME DATA
M. J. LEACH, H. J. BERNSTEIN, J. L. TICHLER, R. J. MORAN, L. L. LAWRENCE, D. W. NIEBUHR, and P. A. KESSLER 1986 4 p Presented at the 10th International CODATA Conference, Ottawa, Canada, 14 Jul. 1986
(Contract DE-AC02-76CH-00016)
(DE86-014769; BNL-38433; CONF-860762-1) Avail: NTIS HC A01/MF A01

Meteorological information is needed by scientific personnel at Brookhaven National Laboratory (BNL) for various purposes. An automated system, used to acquire, archive, and provide users with weather data, is described. Hardware, software, and some of the examples of the uses of the system are detailed. DOE

N87-19981# Lawrence Livermore National Lab., CA.
INTEGRATION OF COMMUNICATIONS WITH THE INTELLIGENT GATEWAY PROCESSOR
V. E. HAMPEL 1986 19 p Presented at the Seminar on Integrated Power Plant Computer Communications, San Francisco, Calif., 25 Aug. 1986
(Contract W-7405-ENG-48)
(DE87-002386; UCRL-95277; CONF-8608110-2) Avail: NTIS MF A01

The Intelligent Gateway Processor (IGP) software is being used to interconnect users equipped with different personal computers and ASCII terminals to mainframe machines of different make. This integration is made possible by the IGP's unique user interface and networking software. Prototype systems of the table-driven, interpreter-based IGP have been adapted to very different programmatic requirements and have demonstrated substantial increases in end-user productivity. Procedures previously requiring days can now be carried out in minutes. The IGP software has been under development by the Technology Information Systems (TIS) program at Lawrence Livermore National Laboratory (LLNL) since 1975 and is in use by several federal agencies since 1983. The Air Force is prototyping applications which range from automated identification of spare parts for aircraft to office automation and the controlled storage and distribution of technical orders and engineering drawings. Other applications of the IGP are the Information Management System (IMS) for aviation statistics in the Federal Aviation Administration (FAA), the Nuclear Criticality Information System (NCIS) and a nationwide Cost Estimating System (CES) in DOE, the library automation network of the Defense Technical Information Center (DTIC), and the modernization program in the Office of the Secretary of Defense (OSD). DOE

N87-20772# Argonne National Lab., IL. Computing Services.
GUIDE TO SHARING PERSONAL COMPUTER RESOURCES VIA LOCAL AREA NETWORKS, REVISED
L. WINKLER Aug. 1986 70 p
(Contract W-31-109-ENG-38)
(DE86-016088; ANL/TM-438-REV) Avail: NTIS HC A04/MF A01

This Guide is for professional staff who commonly need computing tools on personal computers, minicomputers, mainframe computers, and supercomputers. It provides information and recommendations about personal computer local area networks in the context of the larger scheme of computing tools and services at the Laboratory. The material presented here is for the person considering installation of a personal computer local area network. Chapter 1 introduces the reader to the concept of personal computer local area networks and provides background material on networking. Chapter 2 summarizes Computing Services' evaluation of personal computer local area networking in general terms. Chapter 3 describes the technical and functional details of Computing Services' Personal Computer Local Area Network Evaluation and Demonstration Project. Chapters 4 and 5 are for individuals who are familiar with personal computing and who will be responsible for establishing a local area network. Chapter 4 covers technical issues relating to the prototype network installation in Building 221. Chapter 5 warns potential users what to expect when establishing a local area network. DOE

N87-24116# California Univ., Berkeley. Lawrence Berkeley Lab.
THE FUTURE OF INTERSITE NETWORKING
Nov. 1986 361 p Presented at the 1st Annual Energy Research Workshop on Interlaboratory Computing, Berkeley, Calif., 27 Oct. 1986
(Contract DE-AC03-76SF-00098)
(DE87-007912; LBL-22460; CONF-8610138) Avail: NTIS HC A16

Copies of viewgraphs and summaries of three discussion groups are presented. The purpose of the workshop was to identify strategies for meeting the computer networking needs of the scientists under the Office of Energy Research. DOE

N88-11925*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
LEWIS INFORMATION NETWORK (LINK): BACKGROUND AND OVERVIEW
ROGER R. SCHULTE Nov. 1987 34 p
(NASA-TM-100162; E-3724; NAS 1.15:100162) Avail: NTIS HC A03/MF A01 CSCL 17/2

The NASA Lewis Research Center supports many research facilities with many isolated buildings, including wind tunnels, test cells, and research laboratories. These facilities are all located on a 350 acre campus adjacent to the Cleveland Hopkins Airport. The function of NASA-Lewis is to do basic and applied research in all areas of aeronautics, fluid mechanics, materials and structures, space propulsion, and energy systems. These functions require a great variety of remote high speed, high volume data communications for computing and interactive graphic capabilities. In addition, new requirements for local distribution of intercenter video teleconferencing and data communications via satellite have developed. To address these and future communications requirements for the next 15 yrs, a project team was organized to design and implement a new high speed communication system that would handle both data and video information in a common lab-wide Local Area Network. The project team selected cable television broadband coaxial cable technology as the communications medium and first installation of in-ground cable began in the summer of 1980. The Lewis Information Network (LINK) became operational in August 1982 and has become the backbone of all data communications and video. Author

N88-15729# Colorado Univ., Boulder. Dept. of Computer Science.
SELF-ADAPTIVE DATA BASES Annual Report, Sep. 1986 - Sep. 1987
ROGER KING 21 Sep. 1987 3 p
(Contract N00014-86-K-0054)
(AD-A186414; AD-E900710; CU-CS-153-7622) Avail: NTIS HC A01/MF A01 CSCL 05/2

Over the past year, significant progress has been made, including the completion of a prototype database management system, and the publication of several papers. The central contribution of this system, called Cactis, is that it is the first database system to introduce elegant and efficient means for managing derived data. The goal of Cactis is to provide this support within the context of a self-adaptive database implementation. The project has also spawned a number of related efforts. The DBMS is being tested with a complex application, one that is of significant interest to the current research community - software environment technology. Other progress includes the development of a graphical interface to Cactis, one that maintains the philosophy of self-adaptiveness, by allowing the interface to adapt to the needs of a particular user. As an effort independent of Cactis, a system called Moby is under development. It is being coded in lisp, and is an experiment in extending database technology to include the one sort of derived data that Cactis cannot maintain - rule - based data. A final effort this year has been directed toward the support of complex constraints in the Cactis system. As many constraints may be represented as derived data, Cactis is a natural medium for this experimentation. This project is in cooperation with the Naval Ocean Systems Center in San Diego. GRA

N88-21448# National Bureau of Standards, Gaithersburg, MD.
TOWARDS A TRIBOLOGY INFORMATION SYSTEM: THE RESULTS OF A PLANNING WORKSHOP HELD AT THE NATIONAL BUREAU OF STANDARDS, JULY-AUGUST 1985 Final Report
J. RUMBLE and L. SIBLEY Dec. 1987 130 p Sponsored by DOE, Washington, D.C. and American Society of Mechanical Engineering, New York, N.Y.
(PB88-168604; NBS/SP-737; LC-87-619902) Avail: NTIS HC A07/MF A01; also available SOD HC $6.50 as SN003-003-2843-6 CSCL 20/3

A workshop was held in July 1985 to address the needs for a computerized tribology information and data system, as well as possible implementation schemes. Specific categories that were treated were design, numeric data, bibliography, research in progress, newsletter, and product directory. The workshop recommendations detailed four phases of development, starting with a demonstration prototype system and concluding with a full-scale operating data and information base. Specific plans in each phase and for each subject area were developed and are presented. While continual input will be sought from the technical community to refine those plans, it is hoped that immediate efforts can begin in at least some of the areas, and that system use will quickly develop to a significant level, both nationally and internationally. GRA

N88-21697*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, OH.
LABORATORY INFORMATION MANAGEMENT SYSTEM (LIMS): A CASE STUDY
KAREN S. CRANDALL, JUDITH V. AUPING, and ROBERT G. MEGARGLE (Cleveland State Univ., Ohio.) 1987 18 p Presented at the 1st International Laboratory Information Management Systems Meeting, Pittsburgh, Pa., 23-25 Jan. 1987
(NASA-TM-100835; E-4024; NAS 1.15:100835) Avail: NTIS HC A03/MF A01 CSCL 09/2

In the late 70's, a refurbishment of the analytical laboratories serving the Materials Division at NASA Lewis Research Center was undertaken. As part of the modernization efforts, a Laboratory Information Management System (LIMS) was to be included. Preliminary studies indicated a custom-designed system as the best choice in order to satisfy all of the requirements. A scaled down version of the original design has been in operation since 1984. The LIMS, a combination of computer hardware, provides the chemical characterization laboratory with an information data base, a report generator, a user interface, and networking capabilities. This paper is an account of the processes involved in designing and implementing that LIMS. Author

N88-24838# North Carolina Univ., Chapel Hill. Dept. of Statistics.
INFORMATION AND STOCHASTIC SYSTEMS Final Report, 1 Dec. 1986 - 30 Nov. 1987
CHARLES R. BAKER 30 Nov. 1987 6 p
(Contract AF AFOSR-0106-87)
(AD-A192167; AFOSR-88-0051TR) Avail: NTIS HC A02/MF A01 CSCL 25/2

Equipment was purchased to support research in two main areas: communication channels with memory and signal detection and classification problems involving non-Gaussian stochastic processes. The research on communication channels involves largely the study of channel capacity under various assumptions and constraints. The research in signal detection and classification includes modeling, data analysis, and the development and evaluation of detection algorithms. GRA

N88-26863# SRI International Corp., Menlo Park, CA.
AN EVALUATION METHODOLOGY FOR DEPENDABLE MULTIPROCESSORS Final Technical Report, Jul. - Sep. 1987
JACK GOLDBERG Mar. 1988 73 p
(Contract F19628-86-D-0003)
(AD-A192799; SRI-ESU-2918; RADC-TR-88-23) Avail: NTIS HC A04/MF A01 CSCL 12/6

This report outlines an approach to a methodology for evaluating high performance, reliable computers. The purpose of the methodology is to provide a framework and a basis for tool development that will make it possible to conduct such evaluations systematically and efficiently. The increasing complexities of high performance computer systems and the stringent requirement for high reliability in harsh environments (e.g., space) make such an evaluation methodology an absolute necessity. The report discusses sources of difficulty in evaluation, such as the many complexities of multiprocessing, the difficulty of distinguishing various factor (algorithms, software), operating systems, fault diagnostics, etc.) that affect performance and fault tolerance, the use of formal and experimental analyses, and the special problems of computer security. Criteria and suggestions are given for the design of unified working environments and specific classes of tools that support the methodology. GRA

N88-30452# Massachusetts Inst. of Tech., Cambridge.
INTEGRATING IMAGES, APPLICATIONS, AND COMMUNICATIONS NETWORKS, VOLUME 5 Final Report, Sep. 1986 - Jan. 1988
AMAR GUPTA and STUART MADNICK Dec. 1987 342 p
(Contract DTRS57-85-C-00083)
(AD-A195854; AD-E500978; MIT-KBIISE-5) Avail: NTIS HC A15/MF A02 CSCL 05/2

This volume presents practical ideas and prototype systems for integrating existing information and communications resources. It is divided into four parts. The first part, Knowledge-Based Pictorial Information Systems, describes a prototype system that enables users to manage all types of information, especially pictorial information. The Image Database Management System (IDBM) provides an integrated standard that can be used to specify the information to be retrieved, in a format acceptable to all participating computers. The second part, Storage and Retrieval of Pictorial Information in Heterogeneous Computing Systems, studies existing techniques for storing pictorial images, such as bit-mapped mechanisms, vector-based techniques, and quadtree and pyramid-oriented approaches. Recent advances in compression techniques are also discussed. The third part, An Expert System for Accessing and Integrating Design Analysis Knowledge, presents an approach for integrating information from multiple design environments. Mechanical design packages such as CADAM and

CATIA, thermal design packages such as ITAM and PHOENIS, and other specialized packages can be linked together through a common expert system. The fourth part highlights a number of critical connectivity issues in the context of data communication networks maintained by two large organizations. GRA

N89-10668# Massachusetts Inst. of Tech., Cambridge.
INTEGRATING DISTRIBUTED HOMOGENEOUS AND HETEROGENEOUS DATABASES: PROTOTYPES, VOLUME 3 Final Report, Sep. 1986 - Jan. 1988
AMAR GUPTA and STUART MADNICK Dec. 1987 220 p
(Contract DTRS57-85-C-00083)
(AD-A195852; AD-E500978; MIT-KBIISE-3) Avail: NTIS HC A10/MF A02 CSCL 12/7

This volume discusses key issues relating to distributed databases, and presents alternate methods for integrating them together. It is divided into four parts. The first part, Evolution Towards Strategic Applications of Databases Through Composite Information Systems, divides applications into four categories: intercorporate, inter-divisional, inter-product, and inter-model. The second part, Distributed Homogenous Database systems: A Comparison between Oracle and Ingres, compares commercial products in terms of the levels of transparency and independence supported by them. The third part, Achieving a Single Model for Integrating Heterogenous Databases attempts to come up with a single unified modified that encompasses both the database issue and the communication issue. In the communication area, there are two types of standards: connection-oriented and connectionless. In the database area there are multiple standards suited for different environments. The fourth part, A Technical Comparison of Distributed Heterogenous Database Management Systems, describes eight systems being developed around the world. Because of the added complexity involved in translating between multiple systems and multiple data models, distributed heterogenous database systems are more complex than equivalent homogenous ones. While all of these eight systems are able to do global retrieves, their ability to perform global updates and other capabilities is varied. GRA

N89-10674# Arinc Research Corp., Annapolis, MD.
DEVELOP AN AUTOMATED DATA BASE MANAGEMENT SYSTEM (DBMS): REPORT ON DBMS SOFTWARE AND USER'S GUIDE Final Report
Aug. 1987 55 p
(Contract DE-AC01-85DP-20133)
(DE88-015996; DOE/DP-20133/T1; ARINC-3067-01-01-4437)
Avail: NTIS HC A04/MF A01

This final report, prepared for the Department of Energy Office of Military Application (OMA), describes the Task Two efforts of Contract DE-AC01-85DP20133. It addresses the software packages that constitute the OMA automated data base management system (DBMS) developed by ARINC Research Corporation. Off-the-shelf software adapted for these efforts and the software written by ARINC Research specifically for the project are also described. In addition to providing details about the DBMS software, the report includes and OMA DBMS User's Guide to be employed as a reference manual by OMA. The report was prepared after an approximately ten-month period devoted to user evaluation of the system. DOE

N89-11621# National Bureau of Standards, Gaithersburg, MD. Information Systems Engineering Div.
COMPUTER SCIENCE AND TECHNOLOGY: GUIDE TO DISTRIBUTED DATABASE MANAGEMENT
E. N. FONG and B. K. ROSEN Apr. 1988 36 p
(PB88-201561; NBS/SP-500/154) Avail: NTIS HC A03/MF A01 CSCL 05/2

Distributed Database Management Systems are exciting and potentially very powerful. However, distributed database management systems often have created increased complexity of database management and controls without providing the expected benefit to the organization's operations. Distributed database management systems may not be desirable for every organization. Their benefits can be realized only with careful planning, and evaluation of alternative strategies. The guide provides an organization's decision makers the appropriate information to make good decisions in evaluating distributed database management technologies for their individual environments. Also, the guide aids in planning for an orderly migration path into a distributed database environment. GRA

N89-13154# Carnegie-Mellon Univ., Pittsburgh, PA. Software Engineering Inst.
SOFTWARE PROCESS MODELING Final Report
MARC I. KELLNER and GREGORY A. HANSEN May 1988 53 p
(Contract F19628-85-C-0003)
(AD-A197137; CMU/SEI-88-TR-9; ESD-TR-88-010) Avail: NTIS HC A04/MF A01 CSCL 12/5

This paper discusses the topic of software process modeling, a means of reasoning about the processes used to develop and maintain software. Although this term is beginning to come into common use, its meaning varies widely. For the purposes of this paper, software process modeling is defined as a methodology that encompasses a representation approach, comprehensive analysis capabilities, and the capability to make predictions regarding the effects of changes to a process. This paper reports the approach we have taken to software process modeling and summarizes our experiences on the Post Deployment Software Support (PDSS) Project. The paper is structured as follows: Chapter 1 - Introduction; Chapter 2 - Overview of the objectives and capabilities of software processing modeling; Chapter 3 - Overview of the PDSS Information Management Project, describing the context for our modeling experience; Chapter 4 - Details and examples of the modeling approach used on the PDSS Project; Chapter 5 - Outcomes and results of those modeling efforts; Chapter 6 - Lessons learned from this effort, and a list of the capabilities required for successful software process modeling; and Chapter 7 - Conclusions and directions for future work. GRA

N89-13174# Swedish Inst. of Computer Science, Uppsala.
PRACTICAL ISSUES RELATING TO THE INTERNAL DATABASE PREDICATES IN AN OR-PARALLEL PROLOG: EXTENSIONS AND USEFUL HACKS
M. CARLSSON, K. DANHOF, and R. OVERBEEK (Argonne National Lab., Ill.) 1988 14 p Presented at the 5th International Logic Programming Conference, Seattle, Wash., 15 Aug. 1988 Prepared in cooperation with Southern Illinois Univ., Carbondale; Argonne National Lab., Ill.
(Contract W-31-109-ENG-38)
(DE88-010019; CONF-880859-1) Avail: NTIS HC A03/MF A01

This technical report is being written to document and explain some of the insights the authors have gained during the implementation of two OR-parallel Prolog systems for shared-memory multiprocessors. We have been quite amazed by how much power and functionality can be achieved through the implementation of just a few primitive predicates. We introduce a few relatively trival predicates which allow one to implement versions of findall/3, bagof/3, and setof/3 for the multiprocessors environment. Then we show how these predicates can be used to implement AND-parallelism. Finally, we illustrate their use for implementing a limited notion of streams, and how such streams can be used to create a compiler that achieves excellent speedups for multiprocessors with a limited number of processors. DOE

N89-13184# State Univ. of New York, Buffalo. Dept. of Computer Science.
SNEPS CONSIDERED AS A FULLY INTENSIONAL PROPOSITIONAL SEMANTIC NETWORK
STUART C. SHAPIRO and WILLIAM J. RAPAPORT *In* Syracuse Univ., N. Y. Northeast Artificial Intelligence Consortium (NAIC). Review of Technical Tasks, Volume 2, Part 1 p 181-226 Jul. 1987
(Contract F30602-85-C-0008; SUNY-BRDF-150-9216)
Avail: NTIS HC A21/MF A03 CSCL 09/2

A semantic network is a data structure typically consisting of

labeled nodes and labeled, directed arcs. The Semantic Network Processing System (SNePS) can be viewed as a semantic network language with facilities for building semantic networks to represent virtually any kind of information or knowledge; retrieving information from them; and performing inference with them. The interpretation of a particular use of SNePS in terms of a philosophical theory of mental entities inspired by Alexius Meinong's Theory of Objects is offered. Presentation of the nodes and arcs used in the interaction, together with some other important ones is given. The criteria for a semantic network are discussed. Author

N89-13901# Colorado State Univ., Fort Collins.
COMPUTER SCIENCE AND STATISTICS. PROCEEDINGS OF THE 18TH SYMPOSIUM ON THE INTERFACE Final Report, 15 Feb. 1986 - 14 Feb. 1987
THOMAS J. BOARDMAN, ed. and IRENE M. STEFANSKI, ed. (American Statistical Association, Washington, D. C.) 26 Aug. 1987 451 p Symposium held in Fort Collins, Colo., 19-21 Mar. 1986
(Contract AF-AFOSR-0070-86; AF PROJ. 2304)
(AD-A191296; AFOSR-88-0153TR) Avail: NTIS HC A20/MF A03 CSCL 12/6

The procedings of a conference on the interface between computer science and statistics are given. Parallel algorithms, parallel architecture, decision making, computer graphics, programming languages, data management, data base management systems, expert systems, survey sampling, supercomputer techniques, and simulation are among the topics discussed.

N89-13911# RAND Corp., Santa Monica, CA.
IMPLICATIONS OF THE LANGUAGE OF DATA FOR COMPUTING SYSTEMS
WILLIAM H. ROGERS *In* Colorado State Univ., Computer Science and Statistics. Proceedings of the 18th Symposium on the Interface p 90-95 26 Aug. 1987 Prepared in cooperation with Language of Data Project, Sausalito, Calif.
Avail: NTIS HC A20/MF A03 CSCL 12/6

The kind of computer system envisioned under the Language of Data (LOD), including applications which have been implemented and elements not yet developed, is discussed. As such, the system represents a design consideration for future software developers rather than a finished product. Moreover, the set of programs discussed here should not be confused with the theory itself. The understanding of the structure of the datum and of tables developed by this project could be applied to other programs as well. The envisioned programs focus primarily on three themes. First, they focus on a principal application of LOD, the documentation of large databases. Second, they illustrate some of the formal ideas (computation with descriptors and applicability conditions) in ways familiar to statisticians. Third, they incorporate some of the insight into table structure to provide several natural and powerful tools for the data analyst. Author

N89-13920# Massachusetts Inst. of Tech., Cambridge.
STATISTICALLY SOPHISTICATED SOFTWARE AND DINDE
R. W. OLDFORD and S. C. PETERS *In* Colorado State Univ., Computer Science and Statistics. Proceedings of the 18th Symposium on the Interface p 160-167 26 Aug. 1987
(Contract NSF IST-84-20614)
Avail: NTIS HC A20/MF A03 CSCL 12/6

A prototype system called DINDE and the directed network model of statistical analysis on which it is currently based are discussed. DINDE is a highly interactive display oriented system where the user carries out the analysis by building and maintaining a network representation of it. An example analysis is used to describe this interaction and the analysis management tools required. Author

N89-13921# Washington Univ., Seattle.
A DATA VIEWER FOR MULTIVARIATE DATA
ANDREAS BUJA, CATHERINE HURLEY, and JOHN ALAN MCDONALD *In* Colorado State Univ., Computer Science and Statistics. Proceedings of the 18th Symposium on the Interface p 171-174 26 Aug. 1987 Prepared in cooperation with Bell Communications Research, Inc., Holmdel, N.J.
Avail: NTIS HC A20/MF A03 CSCL 12/6

The Data Viewer is a system for the exploratory analysis of large, high-dimensional datasets, being developed on a Lisp Machine. Suppose we have a multivariate dataset consisting of up to 1000 observations on an (arbitrarily large) number of quantitative variables. How can we examine it. The data viewer tackles this problem using Grand Tour techniques: by moving projection planes it displays a scatterplot movie. Design issues are crucial in the development of this system, in particular with regard to questions of user interface. The Lisp Machine supports object-oriented programming and the use of constraints, and these features are influential in our implementation. Author

N89-14068# Brookhaven National Lab., Upton, NY.
THE AGS BOOSTER CONTROL SYSTEM
R. FRANKEL, E. AUERBACH, B. CULWICK, T. CLIFFORD, S. MANDELL, R. MARIOTTI, C. SALWEN, and N. SCHUMBURG 1988 3 p Presented at the 1st European Particle Accelerator Conference, Rome, Italy, 7 Jun. 1988
(Contract DE-AC02-76CH-00016)
(DE88-013990; BNL-41438; CONF-880695-44) Avail: NTIS HC A01

Although moderate in size, the Booster construction project requires a comprehensive control system. There are three operational modes: as a high intensity proton injector for the AGS, as a heavy ion accelerator and injector supporting a wide range of ions and as a polarized proton storage injector. These requirements are met using a workstation based extension of the existing AGS control system. Since the Booster is joining a complex of existing accelerators, the new system will be capable of supporting multiuser operational scenarios. A short discussion of this system follows. DOE

N89-14176# Air Force Inst. of Tech., Wright-Patterson AFB, OH. Dept. of Computer Science.
DESIGN AND IMPLEMENTATION OF A CONTROLLER AND A HOST SIMULATOR FOR A RELATIONAL REPLICATED DATABASE SYSTEM M.S. Thesis
LEONARD A. LYON 1987 174 p
(AD-A198951; AFIT/CI/NR-88-61) Avail: NTIS HC A08/MF A01 CSCL 12/5

Database machines and parallel database systems are becoming a viable alternative for handling transactions on voluminous databases especially with the declining cost of hardware. Database research has spawned a variety of parallel processing architectures to improve the performance of database machines. However, many of these architectures are based upon unique hardware configurations and technologies including processor-per-track, processor-per-head, and off-the-disk designs. Alternative backend database system which will be utilized for processing transactions on voluminous databases. The complete performance analysis and design of RRDS is currently being carried out by a Ph.D. student at the University of Central Florida. RRDS supports the relational data model and consists of multiple processors running replicated copies of the database management system (DBMS) software on a partitioned database. The general hardware organization is composed of a controller and a collection of replicated computers which can be implemented as microcomputers or minicomputers. GRA

N89-14700# Argonne National Lab., IL. Mathematics and Computer Science Div.
ELEFUNT TEST RESULTS UNDER FORTRAN-PLUS ON THE ACTIVE MEMORY TECHNOLOGY DAP 510-8
W. J. CODY Sep. 1988 12 p
(Contract W-31-109-ENG-38)
(DE88-017264; ANL/MCS-TM-125) Avail: NTIS HC A03/MF A01

This report discusses testing of the elementary function library supplied with FORTRAN-PLUS on the Active Memory Technology DAP 510-8 computer in the Mathematics and Computer Science

Division's Advanced Computing Research Facility. Performance tests were conducted using the ELEFUNT suite of programs from the book Software Manual for the Elementary Functions by Cody and Waite. The report includes a brief description of the computing environment, a short analysis of DAP arithmetic, and a summary and analysis of the test results. DOE

N89-15597*# Lockheed Missiles and Space Co., Menlo Park, CA. Artificial Intelligence Center.
A MULTIPROCESSING ARCHITECTURE FOR REAL-TIME MONITORING Abstract Only
JAMES L. SCHMIDT, SIMON M. KAO, JACKSON Y. READ, SCOTT M. WEITZENKAMP, and THOMAS J. LAFFEY *In* NASA, Marshall Space Flight Center, Fourth Conference on Artificial Intelligence for Space Applications p 369 Oct. 1988
Avail: NTIS HC A21/MF A03 CSCL 09/2

A multitasking architecture for performing real-time monitoring and analysis using knowledge-based problem solving techniques is described. To handle asynchronous inputs and perform in real time, the system consists of three or more distributed processes which run concurrently and communicate via a message passing scheme. The Data Management Process acquires, compresses, and routes the incoming sensor data to other processes. The Inference Process consists of a high performance inference engine that performs a real-time analysis on the state and health of the physical system. The I/O Process receives sensor data from the Data Management Process and status messages and recommendations from the Inference Process, updates its graphical displays in real time, and acts as the interface to the console operator. The distributed architecture has been interfaced to an actual spacecraft (NASA's Hubble Space Telescope) and is able to process the incoming telemetry in real-time (i.e., several hundred data changes per second). The system is being used in two locations for different purposes: (1) in Sunnyville, California at the Space Telescope Test Control Center it is used in the preflight testing of the vehicle; and (2) in Greenbelt, Maryland at NASA/Goddard it is being used on an experimental basis in flight operations for health and safety monitoring. Author

N89-15773 Clarkson Univ., Potsdam, NY.
GLOBAL UPDATES IN INTEGRATION OF DISTRIBUTED DATABASES Ph.D. Thesis
M. SAMY MOHAMED GAMAL-ELDIN 1988 212 p
Avail: Univ. Microfilms Order No. DA8808024

Applications such as C3I (command, control, communication, and information) systems, banking, and reservation systems are strategic systems. It is desirable to allow updates to distributed data in real time, in addition to having a true conceptual global schema which represents the whole distributed system. Such strategic systems can be created by building a global integration of distributed databases. The problem of integrating separate local databases in a network into a single distributed database, with particular attention to supporting updates in such an integrated database is considered. Constructing methods for update processing in distributed databases requires the solution of problems of relationship among attributes, schema mapping, constraint integration, and update translation. These four problems are addressed in the context of integrating separate databases, all of which are based on the relational data model, or at least have a relational interface to them. Within this context, several problems are addressed: attribute equivalence; embedded attributes; embedded attributes of locality; attribute-locality mappings; locality dependency; 2-dimensional union; global constraints; and globally contradictory constraints. Dissert. Abstr.

N89-16295*# Houston Univ., Clear Lake, TX. High Technologies Lab.
DISTRIBUTING PROGRAM ENTITIES IN ADA
PATRICK ROGERS and CHARLES W. MCKAY *In* NASA, Lyndon B. Johnson Space Center, First International Conference on Ada (R) Programming Language Applications for the NASA Space Station, Volume 1 13 p 1986
Avail: NTIS HC A18/MF A03 CSCL 09/2

In any discussion of distributing programs and entities of programs written in a high order language (HOL), certain issues need to be included because they are generally independent of the particular language involved and have a direct impact on the feasibility of distribution. Of special interest is the distribution of Ada program entities, but many of the issues involved are not specific to Ada and would require resolution whether written in PASCAL, PL/1, Concurrent PASCAL, HAL/S, or any language which provides similar functionality. The following sections will enumerate some of these issues, and will show in what ways they relate to Ada. Also, some (but by no means all) of the issues involved in the distribution of Ada programs and program entities will be discussed. Author

N89-16341*# Veda, Inc., Lexington Park, MD.
GENERIC ADA CODE IN THE NASA SPACE STATION COMMAND, CONTROL AND COMMUNICATIONS ENVIRONMENT
D. P. MCDOUGALL and T. E. VOLLMAN *In* NASA, Lyndon B. Johnson Space Center, First International Conference on Ada (R) Programming Language Applications for the NASA Space Station, Volume 2 13 p 1986
Avail: NTIS HC A22/MF A03 CSCL 09/2

The results of efforts to apply powerful Ada constructs to the formatted message handling process are described. The goal of these efforts was to extend the state-of-technology in message handling while at the same time producing production-quality, reusable code. The first effort was initiated in September, 1984 and delivered in April, 1985. That product, the Generic Message Handling Facility, met initial goals, was reused, and is available in the Ada Repository on ARPANET. However, it became apparent during its development that the initial approach to building a message handler template was not optimal. As a result of this initial effort, several alternate approaches were identified, and research is now on-going to identify an improved product. The ultimate goal is to be able to instantly build a message handling system for any message format given a specification of that message format. The problem lies in how to specify the message format, and one that is done, how to use that information to build the message handler. Message handling systems and message types are described. The initial efforts, its results and its shortcomings are detailed. The approach now being taken to build a system which will be significantly easier to implement, and once implemented, easier to use, is described. Finally, conclusions are offered. Author

N89-16389# Naval Research Lab., Washington, DC.
EDITSPEC: A FORTRAN 77 PROGRAM FOR EDITING AND MANIPULATING SPECTRAL DATA FROM THE VARIAN CARY 2390 UV-VIS-NIR SPECTROPHOTOMETER
R. A. BINSTEAD and J. C. COOPER 19 Oct. 1988 74 p Prepared in cooperation with Geo-Centers, Inc., Fort Washinston, MD
(AD-A200352; NRL-MR-6351) Avail: NTIS HC A04/MF A01 CSCL 12/5

EDITSPEC is a FORTRAN 77 program designed to provide a number of editing features for Ultraviolet-Visible-Near Infrared (UV-VIS-NIR) spectral data obtained from the CARY 2300 - 2400 series spectrophotometers. The program is written to operate on a Hewlett-Packard 1000 computer system but with very few system dependent features to enable easy conversion for operation on other host systems. EDITSPEC provides facilities for correction of experimental artifacts and incorrect file descriptors and also includes calculation routines for smoothed, first derivative and second derivative spectra. The program produces new disk files in either the Cary format or in simple ASCII X,Y format for export to curve fitting programs. GRA

N89-20645# Department of Energy, Washington, DC. Office of High Energy and Nuclear Physics.
FASTBUS STANDARD ROUTINES
May 1988 155 p
(DOE/ER-0367) Avail: NTIS HC A08/MF A01

Standard routines for use with the FASTBUS standard modular high speed data acquisition and control system of ANSI/IEEE Std 960-1986 and IEC Publication 935 are defined. Some basic concepts that are common to all routines are described, as well as routines involved in the management and use of the FASTBUS environment, descriptions of the operational parameters which form part of the FASTBUS environment, and descriptions of the buffer modes which are used to control access to user data buffers by action routines. Aso described are routines for carrying out simple and compound transactions on FASTBUS and primitive FASTBUS actions, routines for handling asynchronous events on FASTBUS - responding to service requests and to interrupt messages, routines that are either system or port dependent, and the response of the implementation to errors. Routines are described for controlling this and for extracting status information about previous action. The final section contains a list of all the error codes along with their severity. Author

N89-22369# California Univ., Los Angeles. Management Science Inst.
REUSING STRUCTURED MODELS VIA MODEL INTEGRATION
ANDREW M. GEOFFRION Sep. 1988 44 p
(Contract N00014-85-K-0143)
(AD-A204652; WMSI-WP-362) Avail: NTIS HC A03/MF A01
CSCL 12/5

This paper begins with a review of reusability and modularity ideas from the software engineering literature, most of which are applicable to the modeling context. Many features of structured modeling support reusability and modularity, and these are noted. The main focus of the paper, however, is on achieving reusability and modularity via the integration of two or more model schemas. A 5-step approach for integrating schemas written in SML (Structured Modeling Language) is proposed for this purpose. Examples are given to illustrate this approach, and the pros and cons of structured modeling for reuse are discussed at some length. GRA

N89-23195# Lawrence Livermore National Lab., CA.
A NEW APPROACH TO SYSTEM TESTING
NANCY STORCH 1 Jun. 1988 7 p Presented at the Structured Development Forum X, San Francisco, CA, 8 Aug. 1988
(Contract W-7405-ENG-48)
(DE89-008660; UCRL-98873; CONF-880894-4) Avail: NTIS HC A02/MF A01

This paper describes actual experiences in designing system level test cases for a large on-line commercial transaction system which had just been implemented. Real world, less than perfect conditions existed. Although software engineering methods had been used during the development, up-to-date available documentation was limited as was the availability of knowledgeable persons. Even so, test cases were needed in a timely fashion. An approach was taken to identify a major section of the software as an object and then to develop a state model for it based on the implementation and availability of certain process information in the database such as: track flags, status, and time stamps. A flow graph was derived from the state transition diagram. Application of basis path testing to a simplified version of the flow graph lead to a meaningful set of test cases which when run found errors. Not only was this testing a success, but the creation of the state model provided valuable documentation for further understanding and maintenance of the software. DOE

N89-24058*# Institute for Computer Applications in Science and Engineering, Hampton, VA.
COMPILING HIGH LEVEL CONSTRUCTS TO DISTRIBUTED MEMORY ARCHITECTURES Final Report
PIYUSH MEHROTRA and JOHN VANROSENDALE Mar. 1989 12 p Submitted for publication
(Contract NAS1-18605)
(NASA-CR-181825; NAS 1.26:181825; ICASE-89-20) Avail: NTIS HC A03/MF A01 CSCL 09/2

Current languages for nonshared memory architectures provide a relative low-level programming environment. A set of primitives such as load balance and data distribution, which allow the programmer to express data-parallel algorithms at a higher level while also permitting control over those aspects of the program critical to performance, are described. Given such a program specification, the compiler automatically generates a distributed program containing send and receive constructs to perform interprocess communication. Author

N89-24068# Stanford Univ., CA. Center for Large Scale Scientific Computation.
A VISUAL OBJECT-ORIENTED UNIFICATION SYSTEM Interim Report
JOSEPH OLIGER, RAMANI PICHUMANI, and DULCE PONCELEON 16 Mar. 1989 38 p
(Contract N00014-82-K-0335; N00014-86-K-0565; N00014-87-K-0384)
(AD-A206228; CLASSIC-89-23) Avail: NTIS HC A03/MF A01 CSCL 12/5

This report introduces a software design platform which departs from the style of most design tools by acting as an extension to, rather than a replacement for, existing design tools. The ultimate goal of this system is to unify and integrate the various functions provided by text editors, graphics editors, text formatters, hyper-text and structured decomposition tools. It uses a very general data structure which can manifest itself in a variety of visual forms while enabling the user to easily create and manipulate the objects it represents. This tool is useful for creating large, general purpose, hierarchically structured programs, data structures, documents, and other similar objects. Moreover, this system is designed to allow for a wide variety of functions to be performed on these data objects (such as graph traversal or functional mapping), both from within the environment as well as externally (for example, mapping concurrent computations onto parallel architectures using a post-processor). This system is also considered to be a springboard for investigating future directions in software design and information management. GRA

N89-24069# Syracuse Univ., NY.
AN EXPERIMENTAL INVESTIGATION INTO SOFTWARE RELIABILITY Final Report, Nov. 1985 - Jan. 1987
AMRIT L. GOEL Oct. 1988 124 p
(Contract F30602-81-C-0193)
(AD-A206293; RADC-TR-88-213) Avail: NTIS HC A06/MF A01 CSCL 12/5

This report presents the results of an experiment investigating the effect of FORTRAN and Ada languages on program reliability. The experimental design employed was a full factorial design, i.e., a design in two variables, each at two levels. The problem used in the experiment was the Launch Interceptor Program (LIP), a simple but realistic anti-missile system. Reliability comparisons between Ada and FORTRAN programs were based on the total number of errors as well as on errors found during various testing phases. Some comparisons were also based on error density, the number of errors per 100 non-comment lines of code. It was found that on the average, the Ada programs had about 70 percent fewer errors than the FORTRAN ones. If errors during unit testing were excluded, the Ada program had about 78 percent less errors. Similar differences were found for data based on error causes and error types. GRA

N89-25219*# Iowa Univ., Iowa City. Dept. of Mechanical Engineering.
A LARGE SCALE SOFTWARE SYSTEM FOR SIMULATION AND DESIGN OPTIMIZATION OF MECHANICAL SYSTEMS
BERNHARD DOPKER and EDWARD J. HAUG *In* NASA. Langley Research Center, Recent Advances in Multidisciplinary Analysis and Optimization, Part 3 p 1319-1333 Apr. 1989
Avail: NTIS HC A22/MF A03 CSCL 09/2

The concept of an advanced integrated, networked simulation and design system is outlined. Such an advanced system can be developed utilizing existing codes without compromising the integrity and functionality of the system. An example has been used to demonstrate the applicability of the concept of the

integrated system outlined here. The development of an integrated system can be done incrementally. Initial capabilities can be developed and implemented without having a detailed design of the global system. Only a conceptual global system must exist. For a fully integrated, user friendly design system, further research is needed in the areas of engineering data bases, distributed data bases, and advanced user interface design. Author

N89-25619*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
CONCURRENT IMAGE PROCESSING EXECUTIVE (CIPE)
MEEMONG LEE, GREGORY T. COOPER, STEVEN L. GROOM, ALAN S. MAZER, and WINIFRED I. WILLIAMS 1 Oct. 1988 102 p
(Contract NAS7-918)
(NASA-CR-185460; NAS 1.26:185460; JPL-PUBL-88-32) Avail: NTIS HC A06/MF A01 CSCL 09/2

The design and implementation of a Concurrent Image Processing Executive (CIPE), which is intended to become the support system software for a prototype high performance science analysis workstation are discussed. The target machine for this software is a JPL/Caltech Mark IIIfp Hypercube hosted by either a MASSCOMP 5600 or a Sun-3, Sun-4 workstation; however, the design will accommodate other concurrent machines of similar architecture, i.e., local memory, multiple-instruction-multiple-data (MIMD) machines. The CIPE system provides both a multimode user interface and an applications programmer interface, and has been designed around four loosely coupled modules; (1) user interface, (2) host-resident executive, (3) hypercube-resident executive, and (4) application functions. The loose coupling between modules allows modification of a particular module without significantly affecting the other modules in the system. In order to enhance hypercube memory utilization and to allow expansion of image processing capabilities, a specialized program management method, incremental loading, was devised. To minimize data transfer between host and hypercube a data management method which distributes, redistributes, and tracks data set information was implemented. Author

N89-26776# Arizona Univ., Tucson. Computer Engineering Research Lab.
FUNCTIONAL DESCRIPTION AND FORMAL SPECIFICATION OF A GENERIC GATEWAY
WON SON CHANG and RALPH MARTINEZ Aug. 1988 227 p Sponsored by Army Inst. for Research in Management Information, Communications and Computer Science, Atlanta, GA
(Contract B-10-695-51)
(AD-A206581; ASQBG-C-89-020) Avail: NTIS HC A11/MF A02 CSCL 12/7

The generic gateway's characteristics can be summarized as follows: (1) It provides a communication protocol conversion up to transport layer; (2) The connection-less and connection-oriented subnetworks or their services can be interoperable; (3) The reliable data transport is expected by each individual subnetwork independently, because the reliable data transport control can not be expected as a global level by their control mismatch; (4) The generic gateway is decomposed with two distinguishable modules, subnetwork independent and subnetwork dependent blocks; (5) Each subnetwork more specifically subnetwork dependents blocks communicate with subnetwork independent block, through the universal service access points; (6) Each subnetwork interfacing modules can be designed and implemented independently. GRA

N89-26777# Arizona Univ., Tucson. Computer Engineering Research Lab.
PROTOCOL INTEROPERABILITY BETWEEN DDN AND ISO (DEFENSE DATA NETWORK AND INTERNATIONAL ORGANIZATION FOR STANDARDIZATION) PROTOCOLS Final Report
JIANYI TAO and RALPH MARTINEZ Aug. 1988 279 p Prepared for Georgia Inst. of Tech., Atlanta
(Contract DA PROJ. B-10-695-SI)
(AD-A206582; ASQBG-C-89-021) Avail: NTIS HC A13/MF A02 CSCL 25/5

This study focuses on the following four problem areas: (1) the general issues involved in protocol conversion, (2) protocol conversion in the DDN to ISO environment, (3) a detailed understanding of both protocol suites, and (4) approaches to achieve interoperability between DDN protocols (TCP/IP) and ISO protocols (TP-4). The study concludes with recommendations for future protocol research in the area of protocol interoperability. GRA

N89-28308# Oak Ridge National Lab., TN. Engineering Technology Div.
APPROACHING DISTRIBUTED DATABASE APPLICATIONS USING A PROGRAMMABLE TERMINAL EMULATOR
J. A. CLINARD, J. J. ROBINSON, J. T. PHILLIPS, JR., and G. L. JOHNSON Jun. 1989 68 p Sponsored in part by Pacific Missile Testing Center
(Contract DE-AC05-84OT-21400)
(DE89-014831; K/DSRD-80) Avail: NTIS HC A04/MF A01

Two separate approaches were used to develop a prototype for entering data into a remote host computer in an automated manner. In the first approach, revisions were implemented in the IBM PC's terminal emulator VTEK 4.2. These revisions allowed prewritten script files to be processed to the host based operating system and applications software as if the script file information had been entered on the keyboard. The script processing capability was implemented taking advantage of existing user defined key capability and the DEC VT100 asynchronous terminal emulation of VTEK communications software. At present the script command and data files must be manually created at the PC using an editor or word processor. The script processing capability works with any host based operating system or application software that interacts with a DEC VT100 terminal. An example is provided where VTEK script processing is used to automatically interact with a VAX-based Database Management System (DBMS), INGRES, appending PC resident data records to an INGRES table, creating a default report, aborting to VMS, and disposing of the report, all without touching a key. An appendix is provided which discusses the second approach of developing a prototype VT100 emulator specifically designed for data entry to a remote host computer system. This software loads data automatically into a Vax Datatrieve data base. It provides an alternative method of prototype development. The challenges for future development are identified and discussed. The use of the programmable terminal emulator for data control in the case of distributed database applications is also discussed. DOE

N89-28330# Naval Postgraduate School, Monterey, CA.
CONVERSION OF MASS STORAGE HIERARCHY IN AN IBM COMPUTER NETWORK M.S. Thesis
LINDA S. MAUCK Mar. 1989 47 p
(AD-A208520) Avail: NTIS HC A03/MF A01 CSCL 05/1

With the shift from batch applications to online systems supporting the strategic role of information, corporate or institutional goals tie directly to the information management functions. This has been true at the Naval Postgraduate School (NPS). Like many other Government installations, the NPS Computer Center has to meet its objectives with less than state-of-the-art hardware. In the early 1980's, the Center employed IBM's 3850 Mass Storage Subsystem (MSS) for online storage of student and faculty data sets. It was installed in December 1980 and performed well for over six years. Faced with IBM's announcement (in February 1985) of the limited future connectivity and compatibility and the increasing maintenance costs, the decision was made to replace the MSS with hardware/software alternative that would use a more modern and reliable architecture. The solution, and data set migration process is defined, and the early experience with a multi-level, software-managed, storage system are described. GRA

N89-28332# Massachusetts Univ., Amherst. Dept. of Electrical and Computer Engineering.
RESOURCE CONTENTION MANAGEMENT IN PARALLEL SYSTEMS Final Report, Jun. - Dec. 1987
CHRISTOS G. CASSANDRAS, JAMES F. KUROSE, and DON TOWSLEY Apr. 1989 151 p
(Contract F30602-81-C-0169)
(AD-A208809; RADC-TR-89-48) Avail: NTIS HC A08/MF A01
CSCL 12/7

This research effort explored two issues: (1) The comparative study of simple load balancing algorithms for distributed real-time systems which showed that simple policies perform just as well as complex policies in a majority of the cases; (2) The second task was to development of on-line optimization procedures for load balancing algorithms and of task scheduling policies with real-time constraints. GRA

N89-70704# Washington Univ., Seattle. Dept. of Computer Science.
ALLOCATION STRATEGIES FOR APL ON THE CHIP (CONFIGURABLE HIGHLY PARALLEL) COMPUTER M.S. Thesis
JAMES L. SCHAAD Mar. 1987 80 p
(Contract N00014-86-K-0264; NSF DCR-84-16878)
(AD-A203761; TR-87-03-06) Avail: NTIS

N89-71248 Datawise, Inc., Orlando, FL.
ALGORITHM FOR SUPPORTING VIEWS IN THE MICROCOMPUTER ENVIRONMENT Final Report
KATHRYN C. KINSLEY 19 Aug. 1986 61 p
(Contract NSF ISI-85-60151)
(PB89-174155; NSF/ISI-86029) Avail: NTIS

N89-71335* Institute for Computer Applications in Science and Engineering, Hampton, VA.
I/O BUFFER PERFORMANCE IN A VIRTUAL MEMORY SYSTEM
STEPHEN W. SHERMAN and RICHARD S. BRICE (George Washington Univ., Washington, DC.) 2 Feb. 1976 26 p Prepared in cooperation with Houston Univ., TX
(Contract NAS1-14101; NGR-09-010-078)
(NASA-CR-185730; ICASE-76-2; NAS 1.26:185730) Avail: NTIS

AI, EXPERT SYSTEMS, AND KNOWLEDGE SYSTEMS

Many of us have high hopes for AI and related concepts and the benefits we see in their use. Concrete applications in IRM are increasing and are presented in this section.

A85-18437#
WHY SOLID MODELING?
T. W. BOULTER (Martin Marietta Aerospace, Orlando, FL) Aerospace America (ISSN 0740-722X), vol. 23, Jan. 1985, p. 94-96.
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The potentials of solid modeling to permit truly automated CAD/CAM are explored in comparisons with the limitations of wire frame (WF) and surface (SM) models. WF cannot differentiate between inner and outer surfaces and SM does not permit computation of mass properties. Solid models eliminate ambiguity and require large computer storage capabilities and fast processing. Physical properties such as moments of inertia, mass, center of gravity, and kinematical behavior can be calculated. The models are built from primitive solids and connected by Boolean operators or from solid segments (SS). SS permits storage of physical data for each segment while the PS must be calculated from the entire shape. Research directions being followed to display dynamic situations, cross-sections, and composite structure components are discussed. M.S.K.

A86-34986* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.
ARTIFICIAL INTELLIGENCE - NEW TOOLS FOR AEROSPACE PROJECT MANAGERS
D. C. MOJA (NASA, Kennedy Space Center, Cocoa Beach, FL) IN: Space and society - Progress and promise; Proceedings of the Twenty-second Space Congress, Cocoa Beach, FL, April 23-26, 1985. Cape Canaveral, FL, Canaveral Council of Technical Societies, 1985, p. 12-1 to 12-6. refs
Copyright

Artificial Intelligence (AI) is currently being used for business-oriented, money-making applications, such as medical diagnosis, computer system configuration, and geological exploration. The present paper has the objective to assess new AI tools and techniques which will be available to assist aerospace managers in the accomplishment of their tasks. A study conducted by Brown and Cheeseman (1983) indicates that AI will be employed in all traditional management areas, taking into account goal setting, decision making, policy formulation, evaluation, planning, budgeting, auditing, personnel management, training, legal affairs, and procurement. Artificial intelligence/expert systems are discussed, giving attention to the three primary areas concerned with intelligent robots, natural language interfaces, and expert systems. Aspects of information retrieval are also considered along with the decision support system, and expert systems for project planning and scheduling. G.R.

A87-16697
INCORPORATING KNOWLEDGE RULES IN A SEMANTIC DATA MODEL - AN APPROACH TO INTEGRATED KNOWLEDGE MANAGEMENT
S. Y. W. SU and L. RASCHID (Florida, University, Gainesville) IN: The engineering of knowledge-based systems; Proceedings of the Second Conference on Artificial Intelligence Applications, Miami Beach, FL, December 11-13, 1985. Washington, DC, IEEE Computer Society Press, 1985, p. 250-256. refs
Copyright

This paper presents a framework for an integrated knowledge base management system. The integration of a rule base of knowledge rules with a database of facts or assertions is a key concept in this KBMS and provides for more efficient knowledge processing and management. The objects of the knowledge base comprise facts and relevant rules; this is supported by a technique of incorporating knowledge rules in a semantic data model. The KBMS supports complete specification of the declarative and operational semantics of various kinds of knowledge rules including integrity and security constraints, deductive rules and expert rules. A mechanism for the automatic triggering of knowledge rules and for incorporating these rules into a sequence of operations in a transaction is supported by the KBMS. Author

A87-16706
A KNOWLEDGE BASED SYSTEM APPROACH TO DOCUMENT RETRIEVAL
G. BISWAS, V. SUBRAMANIAN, and J. C. BEZDEK (South Carolina, University, Columbia) IN: The engineering of knowledge-based systems; Proceedings of the Second Conference on Artificial Intelligence Applications, Miami Beach, FL, December 11-13, 1985. Washington, DC, IEEE Computer Society Press, 1985, p. 455-460. Research supported by NCR. refs
(Contract NSF IST-84-07860)
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This paper discusses the design and implementation of a prototype document retrieval system using a knowledge-based systems approach. Both the domain-specific knowledge base and the inferencing schemes are based on a fuzzy set theoretic framework. Concepts that describe domain topics and relationships between concepts are captured in a knowledge base. Documents are represented as concept-weight pairs and clustered into a few general subsets. The retrieval mechanism uses a two step

approach. In the first step, a pruned list of documents pertinent to the query is produced. In the second step, an evidence combination scheme is used to compute a degree of relevance between the query and individual documents retrieved in step one. Finally, a set of document citations are presented to the user in ranked order as an answer to his query. Author

A88-54484
A DATA-BASE MANAGEMENT SCHEME FOR COMPUTER-AIDED CONTROL ENGINEERING
JAMES H. TAYLOR, KO-HAW NIEH (General Electric Co., Schenectady, NY), and PETER A. MROZ (DuPont Chambers Works, Deepwater, NJ) IN: 1988 American Control Conference, 7th, Atlanta, GA, June 15-17, 1988, Proceedings. Volume 1. New York, Institute of Electrical and Electronics Engineers, 1988, p. 719-724. USAF-sponsored research. refs
Copyright

As CACE (computer-aided control engineering) environments become more comprehensive and more powerful, the need for keeping track of the models, simulations, analysis results, control system designs, and validation study results over the control system design cycle becomes more pressing and the lack of engineering-database-management support becomes more of an impediment to effective controls engineering. In view of this, the authors demonstrate that rigorous engineering-database management for computer-aided control engineering is both important and achievable. A hierarchical organization of CACE database elements is presented, and additional mechanisms for maintaining database integrity are described. I.E.

A89-11718* Nichols Research Corp., Huntsville, AL.
A DATA ANALYSIS EXPERT SYSTEM FOR LARGE ESTABLISHED DISTRIBUTED DATABASES
ANNE-MARIE GNACEK, Y. KIM AN (Nichols Research Corp., Huntsville, AL), and J. PATRICK RYAN (Alabama, University, Huntsville) IN: Applications of artificial intelligence V; Proceedings of the Meeting, Orlando, FL, May 18-20, 1987. Bellingham, WA, Society of Photo-Optical Instrumentation Engineers, 1987, p. 132-137. NASA-supported research.
Copyright

A design for a natural language database interface system, called the Deductively Augmented NASA Management Decision support System (DANMDS), is presented. The DANMDS system components have been chosen on the basis of the following considerations: maximal employment of the existing NASA IBM-PC computers and supporting software; local structuring and storing of external data via the entity-relationship model; a natural easy-to-use error-free database query language; user ability to alter query language vocabulary and data analysis heuristic; and significant artificial intelligence data analysis heuristic techniques that allow the system to become progressively and automatically more useful. V.L.

A89-12182
SOURCES AND STANDARDS FOR COMPUTERIZED MATERIALS PROPERTY DATA AND INTELLIGENT KNOWLEDGE SYSTEMS
J. G. KAUFMAN (National Materials Property Data Network, Columbus, OH) Engineering with Computers (ISSN 0177-0667), vol. 4, no. 1-2, 1988, p. 75-85. refs
Copyright

The current status of the National Materials Property Data Network, Inc. (MPD Network) and the objectives of the newly formed ASTM Committee E-49 on computerization of Material Property Data are reviewed. The MPD Network is aimed at providing engineers and scientists with on-line access to worldwide sources of reliable, well-documented material property data. A pilot MPD Network is now operating on-line for financial sponsors, and plans are being made for commercial distribution of the Network. ASTM Committee E-49 has the mission of developing and providing guidelines and standards to aid the builders, maintainers, and suppliers of data bases in meeting the needs of industry and in establishing compatible and consistent sources capable of sharing data. V.L.

A89-17998
AUTOTESTCON '88; PROCEEDINGS OF THE IEEE INTERNATIONAL AUTOMATIC TESTING CONFERENCE, MINNEAPOLIS, MN, OCT. 4-6, 1988
Conference sponsored by IEEE. New York, Institute of Electrical and Electronics Engineers, Inc., 1988, 341 p. For individual items see A89-17999 to A89-18037.
Copyright

The conference presents papers on ATE prognostics for the 90s, testing perspectives, the international session, specialized ATE applications, software trends, IFTE, portable testers, diagnostic techniques, MATE, and integrated diagnostics. Other topics include CASS, BIT testability, supercomputing, TPS, artificial intelligence, advanced technology, RF/EW, and procurement in the 1990s. Consideration is also given to DoD initiatives in the automation of the testability/diagnostic design process, analysis tools for the evaluation of maintenance software, and a portable miniature anechoic chamber. K.K.

A89-20833
AN APPROACH TO AUTONOMOUS ATTITUDE CONTROL FOR SPACECRAFT
R. E. WAGNER and A. N. BLASDEL (Ford Aerospace Corp., Sunnyvale, CA) IN: Guidance and control 1988; Proceedings of the Annual Rocky Mountain Guidance and Control Conference, Keystone, CO, Jan. 30-Feb. 3, 1988. San Diego, CA, Univelt, Inc., 1988, p. 51-64. refs
(AAS PAPER 88-004) Copyright

The use of knowledge based systems for an autonomous satellite anomaly resolution system has been studied. This paper presents the approach to automating many of the operational functions associated with spacecraft and demonstrates the approach by using an attitude control scenario. The described model-based representation of physical systems allows the decomposition of these issues into approachable research projects. Author

A89-21801* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
1988 GODDARD CONFERENCE ON SPACE APPLICATIONS OF ARTIFICIAL INTELLIGENCE, GREENBELT, MD, MAY 24, 1988, PROCEEDINGS
JAMES L. RASH, ED. (NASA, Goddard Space Flight Center, Greenbelt, MD) Conference sponsored by NASA. Telematics and Informatics (ISSN 0736-5853), vol. 5, no. 3, 1988, 218 p. For individual items see A89-21802 to A89-21816; Previously announced in STAR as N88-30330.
Copyright

This publication comprises the papers presented at the 1988 Goddard Conference on Space Applications of Artificial Intelligence held at the NASA/Goddard Space Flight Center, Greenbelt, Maryland on May 24, 1988. The purpose of this annual conference is to provide a forum in which current research and development directed at space applications of artificial intelligence can be presented and discussed. The papers in these proceedings fall into the following areas: mission operations support, planning and scheduling; fault isolation/diagnosis; image processing and machine vision; data management; modeling and simulation; and development tools methodologies. Author

A89-21803* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
ARTIFICIAL INTELLIGENCE COSTS, BENEFITS, AND RISKS FOR SELECTED SPACECRAFT GROUND SYSTEM AUTOMATION SCENARIOS
WALTER F. TRUSZKOWSKI (NASA, Goddard Space Flight Center, Greenbelt, MD), BARRY G. SILVERMAN (IntelliTek, Inc., Rockville, MD; George Washington University, Washington, DC), MARTHA KAHN, and HENRY HEXMOOR (IntelliTek, Inc., Rockville, MD) (NASA, 1988 Goddard Conference on Space Applications of

Artificial Intelligence, Greenbelt, MD, May 24, 1988) Telematics and Informatics (ISSN 0736-5853), vol. 5, no. 3, 1988, p. 163-177. Previously announced in STAR as N88-30332. refs
Copyright

In response to a number of high-level strategy studies in the early 1980s, expert systems and artificial intelligence (AI/ES) efforts for spacecraft ground systems have proliferated in the past several years primarily as individual small to medium scale applications. It is useful to stop and assess the impact of this technology in view of lessons learned to date, and hopefully, to determine if the overall strategies of some of the earlier studies both are being followed and still seem relevant. To achieve that end four idealized ground system automation scenarios and their attendant AI architecture are postulated and benefits, risks, and lessons learned are examined and compared. These architectures encompass: (1) no AI (baseline); (2) standalone expert systems; (3) standardized, reusable knowledge base management systems (KBMS); and (4) a futuristic unattended automation scenario. The resulting artificial intelligence lessons learned, benefits, and risks for spacecraft ground system automation scenarios are described. Author

A89-21810* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE SECOND GENERATION INTELLIGENT USER INTERFACE FOR THE CRUSTAL DYNAMICS DATA INFORMATION SYSTEM
NICHOLAS SHORT, JR. (NASA, Goddard Space Flight Center, Greenbelt, MD) and SCOTT L. WATTAWA (Science Applications Research, Inc., Greenbelt, MD) (NASA, 1988 Goddard Conference on Space Applications of Artificial Intelligence, Greenbelt, MD, May 24, 1988) Telematics and Informatics (ISSN 0736-5853), vol. 5, no. 3, 1988, p. 253-268. Previously announced in STAR as N88-30352. refs
Copyright

For the past decade, operations and research projects that support a major portion of NASA's overall mission have experienced a dramatic increase in the volume of generated data and resultant information that is unparalleled in the history of the agency. The effect of such an increase is that most of the science and engineering disciplines are undergoing an information glut, which has occurred, not only because of the amount, but also because of the type of data being collected. This information glut is growing exponentially and is expected to grow for the foreseeable future. Consequently, it is becoming physically and intellectually impossible to identify, access, modify, and analyze the most suitable information. Thus, the dilemma arises that the amount and complexity of information has exceeded and will continue to exceed, using present information systems, the ability of all the scientists and engineers to understand and take advantage of this information. As a result of this information problem, NASA has initiated the Intelligent Data Management (IDM) project to design and develop Advanced Information Management (IDM) project to design and develop Advanced Information Management Systems (AIMS). The first effort of the Project was the prototyping of an Intelligent User Interface (IUI) to an operational scientific database using expert systems, natural language processing, and graphics technologies. An overview of the IUI formulation and development for the second phase is presented. Author

A89-25165#
LIVING IN THE PAST - KNOWLEDGE CAPTURE OF EVOLVING SPACE SYSTEMS
MICHAEL L. DREWS (Texas, University, Arlington) AIAA, Aerospace Sciences Meeting, 27th, Reno, NV, Jan. 9-12, 1989. 8 p. refs
(AIAA PAPER 89-0190) Copyright

A unique intertwining of trends in labor, commercial computer technology, and spacecraft systems design evolution has created an accelerating need for simple knowledge systems for a variety of products. This paper attempts to verify that hypothesis, and offer a generalized example solution, using off-the-shelf products to capture, convert, condense, and integrate data from multiple formats. Author

A89-26960
A DISTRIBUTED SENSOR ARCHITECTURE FOR ADVANCED AEROSPACE SYSTEMS
JEFF SCHOESS and GLEN CASTORE (Honeywell Systems and Research Center, Minneapolis, MN) IN: Sensor fusion; Proceedings of the Meeting, Orlando, FL, Apr. 4-6, 1988. Bellingham, WA, Society of Photo-Optical Instrumentation Engineers, 1988, p. 74-85. refs
Copyright

The Distributed Sensor Architecture (DSA) has been developed to couple knowledge-based processing with integrated sensors technology in order to provide coherent and efficient treatment of information generated by multiple sensors. In this architecture, multiple smart sensors are serviced by a knowledge-based sensor supervisor to process sensor-related data as an integrated sensor group. Multiple sensor groups can be combined to form a reconfigurable, fault-tolerant sensor fusion framework. The role and topology of this architecture are discussed. An example application of DSA sensor data fusion is presented. Author

A89-33677
APPLICATIONS OF ARTIFICIAL INTELLIGENCE VI; PROCEEDINGS OF THE MEETING, ORLANDO, FL, APR. 4-6, 1988
MOHAN M. TRIVEDI, ED. (Tennessee, University, Knoxville) Meeting sponsored by SPIE. Bellingham, WA, Society of Photo-Optical Instrumentation Engineers (SPIE Proceedings. Volume 937), 1988, 698 p. For individual items see A89-33678 to A89-33685.
(SPIE-937) Copyright

Papers are presented on architectures for AI applications, schemes for image understanding, knowledge-based systems, image segmentation and analysis, expert systems, and uncertainty management. Also considered are computational vision, syntactic learning, three-dimensional vision schemes invoiving shape recovery and analysis, computer vision models and applications, and parallel architectures. Other topics include path planning, robotic systems, target detection and image understanding, natural language systems, and knowledge acquisition and representation. R.R.

A89-33679* Texas Univ., Austin.
KNOWLEDGE-BASED NETWORK OPERATIONS
CHUAN-LIN WU, SHOW-WAY YEH (Texas, University, Austin), CHAW-KWEI HUNG, STEVEN P. STEDRY, and JAMES P. MCCLURE (California Institute of Technology, Jet Propulsion Laboratory, Pasadena) IN: Applications of artificial intelligence VI; Proceedings of the Meeting, Orlando, FL, Apr. 4-6, 1988. Bellingham, WA, Society of Photo-Optical Instrumentation Engineers, 1988, p. 44-55. refs
Copyright

An expert system for enhancing the operability of the ground communication element of the Jet Propulsion Laboratory's Deep Space Network is described. The system performs network fault management, configuration management, and performance management in real time. Extracted management information serves as input to the expert system and is used to update a management information data base. The monitor and control activities involve dividing software for each processor into layers which are each modeled as a finite state machine. R.R.

A89-33685
REAL-TIME KNOWLEDGE-BASED MONITORING OF TELEMETRY DATA
JACKSON Y. READ, JAMES L. SCHMIDT, SIMON M. KAO, and THOMAS J. LAFFEY (Lockheed Artificial Intelligence Center, Menlo Park, CA) IN: Applications of artificial intelligence VI; Proceedings of the Meeting, Orlando, FL, Apr. 4-6, 1988. Bellingham, WA, Society of Photo-Optical Instrumentation Engineers, 1988, p. 622-629. refs
Copyright

A multiprocessing architecture environment for real-time monitoring and analysis using knowledge-based problem solving

techniques is presented. In the system, a data managment process gathers, compresses, scales, and sends incoming telemetry data to other tasks, and an inference process uses telemetry data to perform a real-time analysis on the state and health of the Space Telescope. The I/O process receives telemetry information from the data management process and status messages from the inference process, updates its graphical displays in real time, and acts as an interface to the console operator. R.R.

A89-41158* California Univ., Santa Barbara.
KNOWLEDGE-BASED IMAGE DATA MANAGEMENT - AN EXPERT FRONT-END FOR THE BROWSE FACILITY
DAVID M. STOMS, JEFFREY L. STAR, and JOHN E. ESTES (California, University, Santa Barbara) IN: 1988 ACSM-ASPRS Annual Convention, Saint Louis, MO, Mar. 13-18, 1988, Technical Papers. Volume 4. Falls Church, VA, American Congress on Surveying and Mapping and American Society for Photogrammetry and Remote Sensing, 1988, p. 69-78. refs
(Contract NAGW-987)
Copyright

An intelligent user interface being added to the NASA-sponsored BROWSE testbed facility is described. BROWSE is a prototype system designed to explore issues involved in locating image data in distributed archives and displaying low-resolution versions of that imagery at a local terminal. For prototyping, the initial application is the remote sensing of forest and range land. K.K.

A89-45136* Motion Analysis Corp., Santa Rosa, CA.
EXPERTVISION - A VIDEO-BASED NON-CONTACT SYSTEM FOR MOTION MEASUREMENT
JAMES S. WALTON (Motion Analysis Corp., Santa Rosa, CA) IN: Society of Flight Test Engineers, Annual Symposium, 19th, Arlington, TX, Aug. 14-18, 1988, Proceedings. Lancaster, CA, Society of Flight Test Engineers, 1988, p. IV-1.1 to IV-1.6. Research supported by NASA. refs
Copyright

A system known as ExpertVision for obtaining noncontact kinematic measurements using standard video signals is described. In the system, a video processor extracts edge information from video images using a proprietary thresholding technique. Images can be examined in real time at up to 200 fields/s, and as many as four synchronized inputs can be treated simultaneously by buffering the edge coordinates for each view in dedicated RAM memory. Mechanical applications for ExpertVision include the study of simple impacts, ballistics, wing flutter, the kinematics of helicopter rotor blades, and fluid and gas flow problems. R.R.

N84-11756# Carnegie-Mellon Univ., Pittsburgh, PA. Dept. of Computer Science.
METAPHOR AND COMMON-SENSE REASONING Interim Report
J. G. CARBONELL and S. MINTON 5 Mar. 1983 27 p refs
(Contract N00014-79-C-0661; N00014-82-C-5076)
(AD-A131423; CMU-CS-83-110) Avail: NTIS HC A03/MF A01 CSCL 05/10

Inferences based on metaphors appear to play a major role in human common sense reasoning. This paper identifies and analyzes general inference patterns based upon underlying metaphors, in particular the pervasive balance principle. Strategies for metaphor comprehension are explored, and analogical mapping structures are proposed as a means of representing metaphorical relationships between domains. In addition, a framework for a computational model embodying principles of metaphorical common sense reasoning is discussed. GRA

N84-11819# Miami Univ., Coral Gables, FL. Center for Theoretical Studies.
INTERDISCIPLINARY STUDY ON ARTIFICIAL INTELLIGENCE Final Report, 15 Oct. 1982 - 14 Oct. 1983
B. N. KURSUNOGLU Jul. 1983 45 p refs Presented at a Workshop on Biol. Dimensions of Artificial Intelligence, Coral Gables, Fla., 14-25 Mar. 1983
(Contract DAAG29-82-K-0198)
(AD-A131359; ARO-20126.1-AA) Avail: NTIS HC A03/MF A01 CSCL 06/4

The interdisciplinary workshop on biological dimensions of artificial intelligence was organized with a very special objective in mind. The objective was to bring together researchers working in a variety of areas directly concerned with intelligence, such as computer modeling of brain processes, experimental neurophysiology, evolutionary programming and adaptability theory, theory modeling and simulation, self-organizing systems, Biophysics of information processing, cognitive science, and traditional artificial intelligence. The objective behind this objective was to provide a vehicle for reviewing and analyzing directions of artificial intelligence from the perspective of the full range of scholarly activities relevant to this field. Some of the specifically stated objectives in the original letter of invitation suggested topics such as learning and adaptation, evolutionary algorithms for adaptive pattern recognition and motor control, the comparison of computer and biological organization, knowledge representation and the comparison of biological and computer memory, the potential role of parallelism and the physical limits of computation, and the significance of recent experimental work on biochemical and molecular switching processes inside neurons. GRA

N84-11821# Illinois Univ., Urbana. Lab. for Coordinated Science.
ARTIFICIAL INTELLIGENCE IMPLICATIONS FOR INFORMATION RETREIVAL
G. DEJONG Apr. 1983 17 p refs Presented at the 6th Ann. Intern. ACM SIGIR Conf., Washington, 6-8 Jun. 1983
(Contract F49620-82-K-0009; AF PROJ. 2304)
(AD-A131382; AFOSR-83-0658TR) Avail: NTIS HC A03/MF A01 CSCL 06/4

The field of information retrieval is already more aware than many other fields of the relevance of artificial intelligence. Nonetheless there remain exciting applications of artificial intelligence that have been so far overlooked. In this paper we will point out some of the ways artificial intelligence might influence the field of information retrieval. We will then examine one application in more detail to discover the kind of technical problems involved in its fruitful exploitation. GRA

N84-11823# SRI International Corp., Menlo Park, CA.
RESEARCH ON INTERACTIVE ACQUISITION AND USE OF KNOWLEDGE Interim Report, Jul. 1982 - Jan. 1983
M. E. STICKEL May 1983 30 p refs
(Contract N00039-80-C-0575)
(AD-A131306) Avail: NTIS HC A03/MF A01 CSCL 09/2

SRI International is engaged in a long-term effort under DARPA sponsorship to conduct basic research on artificial intelligence problems central to the construction of computer systems that can participate in extended dialogues in natural language with their users. A central thrust to our research is that the system be able to acquire new concepts, facts, and vocabulary through dialogues with the users. It is equally important that the system not be limited to querying for individual facts-as it is the case, for example, with database query systems. Rather this research provides a base for constructing systems that can engage in extended interactions to determine what a user intends (including when this differs from what he literally requests), and that provide responses appropriate to a particular user and discourse situation. Among the core capabilities of these systems are those for reasoning about the knowledge, goals, and plans of other agents where these other agents may be users or other computer systems. This report covers work done on the KLAUS (Knowledge-Learning and-Using System) project during the period July 1982 to January 1983. This work consisted of developing two aspects of KLAUS: the natural-language-processing component and the deduction system component. GRA

N84-11824# Carnegie-Mellon Univ., Pittsburgh, PA. Dept. of Computer Science.
MACHINE LEARNING. PART 1: A HISTORICAL AND METHODOLOGICAL ANALYSIS Interim Report
J. G. CARBONELL, R. S. MICHALSKI, and T. M. MITCHELL 31 May 1983 23 p refs
(Contract N00014-79-C-0661; NSF MCS-82-05166)
(AD-A131424; CMU-CS-83-135-PT-1) Avail: NTIS HC A03/MF A01 CSCL 09/2

Machine learning has always been an integral part of artificial intelligence, and its methodology has evolved in concert with the major concerns of the field. In response to the difficulties of encoding ever-increasing volumes of knowledge in modern AI systems, many researchers have recently turned their attention to machine learning as a means to overcome the knowledge acquisition bottleneck. Part 1 of this paper presents a taxonomic analysis of machine learning organized primarily by learning strategies and secondarily by knowledge representation and application areas. A historical survey outlining the development of various approaches to machine learning is presented from early neural networks to present knowledge intensive techniques. Part II (to be published in a subsequent issue) will outline major present research directions, and suggest viable areas for future investigation. GRA

N84-17929# University of Southern California, Marina del Rey. Inst. for Information Sciences.
INQUIRY SEMANTICS: A FUNCTIONAL SEMANTICS OF NATURAL LANGUAGE GRAMMAR
W. C. MANN Oct. 1983 20 p Presented at the 1st Ann. Conf. of th Assoc. for Computational Linguistics, Pisa (Italy), Sep. 1983
(Contract F49620-79-C-0181)
(AD-A135153; ISI/RS-83-8) Avail: NTIS HC A03/MF A01 CSCL 05/7

Programming a computer to operate to a significant degree as an author is a challenging research task. The creation of fluent multiparagraph text is a complex process because knowledge must be expressed in linguistic forms at several levels of organization, including paragraphs, sentences and words, each of which involves its own kinds of complexity. Accommodating this natural complexity is a difficult problem. To solve it we must separate the various relevant kinds of knowledge into nearly independent collections, factoring the problem. Inquiry semantics is a new factoring of the text generation problem. It is novel in that it provides a distinct semantics for the grammar, independent of world knowledge, discourse knowledge, text plans and the lexicon, but appropriately linked to each. It has been implemented as part of the Nigel text generation grammar of English. This paper characterizes inquiry semantics, shows how it factors text generation, and describes its exemplification in Nigel. The resulting description of inquiries for English has three dimensions: the varieties of operations on information, the varieties of information operated upon, and the subject matter of the operations. The definition framework for inquiries involves both traditional and nontraditional linguistic abstractions, spanning the knowledge to be represented and the plans required for presenting it. Author (GRA)

N84-20270# SRI International Corp., Menlo Park, CA. Artificial Intelligence Center.
RESEARCH ON INTERACTIVE ACQUISITION AND USE OF KNOWLEDGE Final Report, 3 Jul. 1980 - 30 Nov. 1983
B. J. GROSZ and M. E. STICKEL Nov. 1983 208 p
(Contract N00039-80-C-0575; SRI PROJ. 1894)
(AD-A137436) Avail: NTIS HC A10/MF A02 CSCL 09/2

This report summarizes research done on the KLAUS project from July 1981 to July 1983. In July 1980 we began work on the second KLAUS system, called MICROKLAUS, and on the technological base needed to support it. Our initial experience with MICROKLAUS led us to redesign the parsing and translation system to provide for a declarative semantics that is easier both to extend and to maintain, and to augment the deduction system along a number of dimensions. These development efforts proceeded independently, with the natural-language-processing and deduction components being only recently rejoined. We have also made significant progress on several fundamental problems of natural-language semantics and on specifying the planning and reasoning capabilities needed for generating adequate responses. Our systems have been moved from the DEC 2060 to the Symbolics 3600 LISP machine. We expect these new components to provide the core of a new KLAUS system with significantly more powerful capabilities for communication in natural language. The base they provide also leaves us in a position to attack several fundamental research problems holding back the development of advanced KLAUS systems and other types of advanced systems that require high-quality natural-language capabilities. GRA

N84-25370# Stanford Univ., CA. Dept. of Computer Science.
THE ADVANTAGES OF ABSTRACT CONTROL KNOWLEDGE IN EXPERT SYSTEM DESIGN
W. J. CLANCEY Nov. 1983 21 p Presented at the Natl. Conf. on Artificial Intelligence, 1983
(Contract N00014-79-C-0302)
(AD-A139978; SU-STAN-CS-83-995; HPP-83-17; SU-TR-7) Avail: NTIS HC A03/MF A01 CSCL 06/4

A poorly designed knowledge base can be as cryptic as an arbitrary program and just as difficult to maintain. Representing control knowledge abstractly, separately from domain facts and relations, makes the design more transparent and explainable. A body of abstract control knowledge provides a generic framework for constructing knowledge bases for related problems in other domains and also provides a useful starting point for studying the nature of strategies. Author (GRA)

N84-28670# Naval Postgraduate School, Monterey, CA.
OFFICE AUTOMATION: A LOOK BEYOND WORD PROCESSING M.S. Thesis
M. E. DUBOIS, JR. Jun. 1983 135 p refs
(AD-A132764) Avail: NTIS HC A07/MF A01 CSCL 15/5

A capsulated examination of what office automation is, what it consists of, what applications are available, and how it can be implemented is presented. The problems of implementing an automated office and the possible impact it can have on human office workers are also addressed. Word processing was the first of various forms of office automation technologies to gain widespread acceptance and usability in the business world. For many, it remains the only form of office automation technology. Office automation, however, is not just word processing, although it does include the function of facilitating and manipulating text. In reality, office automation is not one innovation, or one office system, or one technology, but rather it is the integration of a broad set of office system, information processing and communications technologies. Office automation encompasses a wide span of applications which are examined individually as well as collectively. GRA

N84-31050# California Univ., San Diego. Inst. for Cognitive Science.
INDUCTIVE INFORMATION RETRIEVAL USING PARALLEL DISTRIBUTED COMPUTATION
M. C. MOZER Jun. 1984 27 p
(Contract N00014-79-C-0323)
(AD-A142712; ICS-8406; ONR-8405) Avail: NTIS HC A03/MF A01 CSCL 09/2

Massively parallel, distributed models of computation offer a new approach to the representation and manipulation of knowledge. This paper reports on an application of parallel models to the area of information retrieval. The retrieval system described makes dynamic use of the internal structure of a database to infer relationships among items in the database. Using these relationships, the system can help overcome incompleteness and imprecision in requests for information, as well as in the database itself. Author (GRA)

N85-11618# Navy Personnel Research and Development Center, San Diego, CA.
IMPLICATIONS OF ARTIFICIAL INTELLIGENCE FOR A USER DEFINED TECHNICAL INFORMATION SYSTEM
R. J. SMILLIE *In* Denver Research Inst. Artificial Intelligence in Maintenance p 353-359 Jun. 1984
(AD-P003938) Avail: NTIS HC A22/MF A03 CSCL 05/2

UDTISis an electronic, computer-based device related to Stanley Kubrick's 2001's HAL. Size is unknown, but UDTIS has contained within it or has access to all the technical and training information of the particular operational system for which UDTIS covers. UDTIS may have multiple screens to permit simultaneous viewing of different types of technical information. Display characteristics are unknown, but it does present the technical information in a form that the user readily understands. The degree of interactiveness is also unknown, but UDTIS is more than user friendly. UDTIS has to know the background and capabilities of the user and has to anticipate the needs of the user. GRA

N85-11626# Hughes Aircraft Co., Long Beach, CA. Support Systems.
INTELLIGENT INFORMATION RETRIEVAL FROM ON-LINE TECHNICAL DOCUMENTATION
A. F. GRIFFIN *In* Denver Research Inst. Artificial Intelligence in Maintenance p 481-491 Jun. 1984
(AD-P003946) Avail: NTIS HC A22/MF A03 CSCL 09/2

Computerized maintenance manuals contained in massive, on-line text and graphics data bases require an intelligent facility for information retrieval. An unsophisticated user must be able to easily find specific facts, procedures, etc. without having to specify precisely the information he seeks. Hughes is developing an intelligent retrieval approach based on semantic network knowledge representation. Because conventional serial computers are too slow for large semantic networks, we have designed and prototyped special purpose, parallel processing hardware called Associative Loop Memory (ALOOP). ALOOP also dynamically organizes a knowledge base in a manner that imitates human memory.
Author (GRA)

N85-11628# Yale Univ., New Haven, CT. Dept. of Computer Science.
MEMORY-BASED EXPERT SYSTEMS Interim Report, 15 Jan. 1983 - 14 Jan. 1984
R. C. SCHANK Aug. 1984 11 p
(Contract F49620-82-K-0010)
(AD-A145612; AFOSR-84-0814TR) Avail: NTIS HC A03/MF A01 CSCL 09/2

During this period the investigators produced four papers with titles including, knowledge reorganization and reasoning style, Assignment of responsibility in ethical judgments, Generating hypotheses to explain prediction failures, and Learning, explanation, and a little history. They are developing a model of expertise that more closely resembles the way in which humans become experts, namely, through experience. They assume that the rule-base is not the primary repository of knowledge, but rather rules are derived from experience. Their model addresses the three problems given above as follows. (1) The knowledge-base is derived primarily from the enumeration of specific cases or experiences. They have found that a human expert is much more capable of recalling experiences than articulating internal rules. They suggest that the reason for this difference is that the human expert may not in fact be using rules in the first place. (2) As problems are presented to the system for which no specific case or rule can match exactly, the system can reason from more general similarities to compute up with an answer. This second level of reasoning should more closely resemble human problem solving behavior when people are confronted with novel situations. (3) A cornerstone to this method is automatic learning. The system's memory of experiences will be changed and augmented by each additional case that is presented. The system will remember the problems that it has encountered and use that information to solve future problems. These three principles of the memory-based expert systems model are being tested in several related projects. GRA

N85-12615# SRI International Corp., Menlo Park, CA. Artificial Intelligence Center.
KNOWLEDGE REPRESENTATION AND NATURAL-LANGUAGE SEMANTICS Annual Technical Report, 1 Jun. 1983 - 30 May 1984
R. C. MOORE 13 Jul. 1984 10 p
(Contract F49620-82-K-0031)
(AD-A146025; AFOSR-84-0799TR; ATR-2) Avail: NTIS HC A02/MF A01 CSCL 05/7

Central to almost all aspects and applications of artificial intelligence is the representation and manipulation of large bodies of knowledge about the world. When viewed from the perspective of their ability to express facts about the external world, however, most knowledge representation schemes currently used in artificial intelligence are constrained by the limits of first-order logic. That is, they provide terms for referring to individuals, predicates for expressing properties and relations of individuals, and mechanisms that achieve some of the effects of propositional connectives and quantifiers. Much research effort has been expended on ways of organizing knowledge bases and developing information retrieval mechanisms; in terms of pure expressive power, however, existing representation systems are rather limited. This issue is brought into sharp focus when one seriously attempts to analyze the semantic content of expressions in natural language, since many types of linguistic expressions seem to require something beyond first-order logic to represent their meaning perspicuously. This project undertakes a program basic research in knowledge representation, focusing on the representation of concepts needed for the semantic analysis of natural language. The objectives of the project are to produce formalisms, suitable for manipulation by computer, for the representation of specific concepts that are important for natural-language semantics, and to give an independent account of the meaning of such representations using the tools of formal logic. Author (GRA)

N85-12784 Pennsylvania Univ., Philadelphia.
PRESERVING THE TIME DIMENSION IN INFORMATION SYSTEMS Ph.D. Thesis
G. ARIAV 1984 219 p
Avail: Univ. Microfilms Order No. DA8417256

Time is a universal and pervasive aspect of human activities, yet it is rarely reflected in the ways computer-based information systems are constructed. A useful and feasible design of a data management system that captures and preserves the inherent dynamics of its content, and explicitly deals with time as it stores, retrieves, and presents data is identified. The functional requirements for temporally oriented information systems, the formulation of a data model that captures subtle aspects of the time dimension, the formulation of end-user's syntax for querying a database based on such data model, and the design of an integrated user interface that graphically conveys temporal properties of data retrieved from the associated database are presented. The guidelines along which the temporally oriented data model and a corresponding data management system were developed are explicated. Dissert. Abstr.

N85-25003 Purdue Univ., West Lafayette, IN.
THE RETRIEVAL EXPERT MODEL OF INFORMATION RETRIEVAL Ph.D. Thesis
S. C. DEERWESTER 1984 102 p
Avail: Univ. Microfilms Order No. DA8500361

The purpose of an information retrieval system is to meet information needs. People who are expert at meeting information needs go about satisfying them much differently and, in general, more successfully than automated systems. A descriptive model of how these experts satisfy information needs is described. This model can be used prescriptively in the design of an information retrieval system whose performance is similar to that of a human expert. Dissert. Abstr.

N86-15213# Defense Technical Information Center, Alexandria, VA.
EXAMINING LEARNING THEORY OF ONLINE INFORMATION RETRIEVAL SYSTEMS AND APPLICATIONS IN COMPUTER-AIDED INSTRUCTION: IMPLICATIONS FOR THE DEFENSE TECHNICAL INFORMATION CENTER'S COMPUTER-AIDED INSTRUCTION Final Report
S. A. WITGES Sep. 1985 39 p
(AD-A159001; DTIC/TR-85/11) Avail: NTIS HC A03/MF A01 CSCL 05/10

The Defense Technical Information Center (DTIC) is developing a computer-aided instruction (CAI) tutorial course entitled Introduction to DROLS Retrieval in order to train users of its online information retrieval system, the Defense RDT&E Online System (DROLS). In order to get maximum benefits of CAI to DTIC, this paper examined three areas: (1) Learning theory as it relates to online retrieval systems. That is, how do humans learn these systems; and (2) Learning theory and its application to CAI; and (3) An advance draft of DTIC's in-house-developed CAI course entitled Introduction to Recommendations are presented in all three areas. GRA

N86-20173# MacAulay-Brown, Inc., Fairborn, OH.
AUTOMATED INFORMATION MANAGEMENT TECHNOLOGY (AIM-TECH): CONSIDERATIONS FOR A TECHNOLOGY INVESTMENT STRATEGY Final Report
W. REITMAN, R. M. WEISCHEDEL, K. R. BOFF, M. E. JONES, and J. P. MARTINO May 1985 216 p
(Contract F33615-82-C-0513)
(AD-A161139; AFAMRL-TR-85-042) Avail: NTIS HC A10/MF A02 CSCL 09/2

The Automated Information Management Technology Program (AIM-Tech) has focused on evaluating the key factors to an investment strategy for implementing artificial intelligence technology in three technical domains: systems design; pilot/aircrew automation; and command, control, and communications (C3). A state-of-the-art review of artificial intelligence (AI), functional specifications for future AI aided systems, and required AI capabilities are discussed. The state-of-art review assesses eight technology areas: expert systems and knowledge engineering, natural language, knowledge representation, computer vision, tutoring and training, planning and problem solving under real world conditions, AI tools and environments, and speech. Functional specifications are classified into three groups for each technical domain: communications, expert understanding, and decision aiding. Futuristic scenarios were constructed in which information and control management choke points are resolved by the hypothetical application of machine intelligence for each of the three domains. Author

N86-30573# Carnegie-Mellon Univ., Pittsburgh, PA. Robotics Inst.
THE ROLE OF DATABASES IN KNOWLEDGE-BASED SYSTEMS Interim Report
M. S. FOX and J. MCDERMOTT Feb. 1986 29 p
(Contract F49620-82-K-0017)
(AD-A166365; CMU-RI-TR-86-3) Avail: NTIS HC A03/MF A01 CSCL 09/2

This paper explores the requirements for database (DB) techniques in the construction of knowledge-based systems (KBS). While early work in Artificial Intelligence (AI) has focused on techniques such as representation and problem-solving, scant attention was paid to the issues to which database research has focused (e.g., data sharing, query optimization, transaction processing). Our principal premise is that although it has appeared that there was little intersection between the particular focus of each group, there is a significant overlap in needs. The maturing of AI techniques has recently led to their application outside of the laboratory, thus thrusting upon them problems requiring DB solutions. On the other hand, DB needs have expanded to include more expressive data models and more powerful query languages (e.g., supporting inference). To ascertain KBS requirements for DBs, three KBSs are described. Each is analyzed from the perspective of the symbol and knowledge level concepts developed by Newell NEWE81. Limitations inherent in this perspective are identified. A new level, the organization level, is proposed as a means of identifying and dealing with these limitations. Three knowledge-based systems are reviewed: XCON/R1, ISIS, and Callisto. GRA

N87-15025# Ohio State Univ., Columbus.
DISTRIBUTED KNOWLEDGE BASE SYSTEMS FOR DIAGNOSIS AND INFORMATION RETRIEVAL Annual Report, 1 Jul. 1984 - 30 Jun. 1985
B. CHANDRASEKARAN Sep. 1985 104 p
(Contract AF-AFOSR-0255-82)
(AD-A170830; AFOSR-86-0509TR) Avail: NTIS HC A06/MF A01 CSCL 09/4

During the year, progress was made in our research on distributed approaches to knowledge-based problem-solving in the following areas: (1)We have developed an approach called consolidation to reason qualitatively about the behavior of systems of components. This approach and the more classical approach of qualitative simulation are complementary; (2)We have made further progress in developing an architectural framework for diagnostic reasoning; (3)We have elucidated some of the criteria that govern how design plans are selected for further refinement in design problem solving; (4)We have identified a number of generic tasks into which the information processing activity of most of the expert systems can be decomposed. These generic tasks are at a much higher level of abstraction, and this should make knowledge acquisition and explanation for expert systems easier; (5)We have clarified how symbolic qualitative knowledge-based processing helps when problems get complex by considering the concrete task of classification. We compare the pattern recognition and artificial intelligence approaches to the problem.
Author (GRA)

N87-18528*# Princeton Univ., NJ. Dept. of Mechanical and Aerospace Engineering.
INVESTIGATION OF AIR TRANSPORTATION TECHNOLOGY AT PRINCETON UNIVERSITY, 1983
ROBERT F. STENGEL *In* NASA Langley Research Center Joint University Program for Air Transportation Research, 1983 p 51-56 Mar. 1987
Avail: NTIS HC A05/MF A01 CSCL 01/3

Progress is discussed for each of the following areas: voice recognition technology for flight control; guidance and control strategies for penetration of microbursts and wind shear; application of artificial intelligence in flight control systems; and computer-aided aircraft design. B.G.

N87-24238# Rutgers - The State Univ., New Brunswick, NJ.
EXPERIMENTS ON THE COGNITIVE ASPECTS OF INFORMATION SEEKING AND INFORMATION RETRIEVING Final Report, 1985-1987
TEFKO SARACEVIC, PAUL KANTOR, ALICE CHAMIS, and DONNA TRIVISON (Case Western Reserve Univ., Cleveland, Ohio.) Jan. 1987 584 p
(Contract NSF IST-87-05411)
(PB87-157699) Avail: NTIS HC A25/MF A04 CSCL 05/2

The aim of the study was to contribute to the formal, scientific characterization of the elements involved in information seeking and retrieving, particularly in relation to the cognitive decisions and human interactions involved. The objectives were to conduct experiments and observations under as real-life conditions as possible relative to: user context of questions in information retrieval; the structure and classification of questions; cognitive traits and decision making of searchers; and different searches of the same question. The study involved 40 users with 1 question each, 39 searchers, 360 searchers, and 5411 unique documents evaluated by users. The final report contains detailed descriptions of model, methods, procedures, and results obtained. An appendix contains the raw data, question, and forms used. GRA

N88-12421*# Pennsylvania State Univ., University Park.
ADVANCED TECHNIQUES FOR THE STORAGE AND USE OF VERY LARGE, HETEROGENEOUS SPATIAL DATABASES. THE REPRESENTATION OF GEOGRAPHIC KNOWLEDGE: TOWARD A UNIVERSAL FRAMEWORK Interim Progress Report 2, 2 Apr. - 30 Jun. 1987
DONNA J. PEUQUET 15 Dec. 1987 66 p
(Contract NAG5-798)
(NASA-CR-181517; NAS 1.26:181517) Avail: NTIS HC A04/MF A01 CSCL 05/2

A new approach to building geographic data models that is based on the fundamental characteristics of the data is presented. An overall theoretical framework for representing geographic data is proposed. An example of utilizing this framework in a Geographic Information System (GIS) context by combining artificial intelligence techniques with recent developments in spatial data processing techniques is given. Elements of data representation discussed include hierarchical structure, separation of locational and conceptual views, and the ability to store knowledge at variable levels of completeness and precision. Author

N88-15725# Defense Technical Information Center, Alexandria, VA. Office of Information Syst Ems and Technology.
DOD GATEWAY INFORMATION SYSTEM (DGIS) COMMON COMMAND LANGUAGE: THE FIRST PROTOTYPING AND THE DECISION FOR ARTIFICIAL INTELLIGENCE
ALLAN D. KUHN, RANDY L. BIXBY, and DUC TIEN TRAN Aug. 1987 26 p
(AD-A185950; AD-F000114; DTIC/TR-87/19; DTIC-AI-FOUNDATION-SER-4) Avail: NTIS HC A03/MF A01 CSCL 05/2

DoD gateway information system (DGIS) began its initial prototype in C language with DIALOG, BRS, NASA/RECON, and DROLS. These prototypes in a third-generation algorithmic language brought to the surface a number of problems and questions in dealing with the distinctions of information systems. The issues concern both the user interface and the development design. Experiences, results, and conclusions in working with these systems are brought out. The decision to convert to and continue CCL development with artificial intelligence tools is explained. Our effort is a merging of PROLOG and C capabilities, to provide the DGIS user an AI-based searcher assistant interface that makes the human-machine interaction more human-like on DGIS. GRA

N88-16392*# Louisiana State Univ., Baton Rouge. Dept. of Computer Science.
PROBLEM SOLVING AS INTELLIGENT RETRIEVAL FROM DISTRIBUTED KNOWLEDGE SOURCES
ZHENGXIN CHEN *In* NASA. Marshall Space Flight Center, Third Conference on Artificial Intelligence for Space Applications, Part 1 p 165-169 Nov. 1987
Avail: NTIS HC A18/MF A03 CSCL 09/2

Distributed computing in intelligent systems is investigated from a different perspective. From the viewpoint that problem solving can be viewed as intelligent knowledge retrieval, the use of distributed knowledge sources in intelligent systems is proposed. Author

N88-16423*# Boeing Aerospace Co., Huntsville, AL.
FOUNDATION: TRANSFORMING DATA BASES INTO KNOWLEDGE BASES
R. B. PURVES, JAMES R. CARNES, and DANNIE E. CUTTS (Boeing Co., Huntsville, Ala.) *In* NASA. Marshall Space Flight Center, Third Conference on Artificial Intelligence for Space Applications, Part 1 p 353-357 Nov. 1987
Avail: NTIS HC A18/MF A03 CSCL 05/2

One approach to transforming information stored in relational data bases into knowledge based representations and back again is described. This system, called Foundation, allows knowledge bases to take advantage of vast amounts of pre-existing data. A benefit of this approach is inspection, and even population, of data bases through an intelligent knowledge-based front-end. Author

N88-16424*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE INTELLIGENT USER INTERFACE FOR NASA'S ADVANCED INFORMATION MANAGEMENT SYSTEMS Abstract Only
WILLIAM J. CAMPBELL, NICHOLAS SHORT, JR., LARRY H. ROLOFS, and SCOTT L. WATTAWA (Science Applications Research, Landover, Md.) *In* NASA. Marshall Space Flight Center, Third Conference on Artificial Intelligence for Space Applications, Part 1 p 359-360 Nov. 1987
Avail: NTIS HC A18/MF A03 CSCL 09/2

NASA has initiated the Intelligent Data Management Project to design and develop advanced information management systems. The project's primary goal is to formulate, design and develop advanced information systems that are capable of supporting the agency's future space research and operational information management needs. The first effort of the project was the development of a prototype Intelligent User Interface to an operational scientific database, using expert systems and natural language processing technologies. An overview of Intelligent User Interface formulation and development is given. Author

N88-17337# Air Force Wright Aeronautical Labs., Wright-Patterson AFB, OH.
MANAGEMENT OF COMPLEX INFORMATION IN SUPPORT OF EVOLVING AUTONOMOUS EXPERT SYSTEMS Final Report, Jan. 1983 - Mar. 1987
EUGENIO MARTINEZ Sep. 1987 75 p
(AD-A186680; AFWAL-TR-87-1123) Avail: NTIS HC A04/MF A01 CSCL 09/2

Automata whose performance is dependent on specific information are referred to as expert systems. These effect and/or induce situations in the mission environment purposedly and as supported by their respective subdomains should be able and capable of evolving concurrently with and relative to an ever evolving mission environment. Information perceived from the latter may be complex, i.e., with multivariate, interrelated and dynamic patterns. The following addresses the problem of complex information management in support of autonomous expert systems within evolving environments. Emphasis is placed on the systems ability to infer generalizations, appraise the circumstantial states of the mission environment, and perform appropriate decision making. GRA

N88-20052# Bolt, Beranek, and Newman, Inc., Cambridge, MA.
KREME (KNOWLEDGE REPRESENTATION, EDITING AND MODELING ENVIRONMENT): A USER'S INTRODUCTION, PHASE 1
GLENN ABRETT, MARK BURSTEIN, JOHN GUNSHENAN, and LIVIA POLANYI Apr. 1987 74 p
(Contract F30602-85-C-0005)
(AD-A188906; BBN-6508) Avail: NTIS HC A04/MF A01 CSCL 05/2

Frame Knowledge Base is a problem which becomes increasingly more complex as taxonomies get larger. KREME provides a classifier to automatically check subsumption relations between frames. The KREME editing environment provides a macro-editing facility, for large-scale revisions of portions of a knowledge base. The macro editor allows sets of operations to be performed repeatedly over portions of a knowledge base. The required editing operations can be demonstrated by example and applied to specified sets of knowledge structure automatically. The KREME Rule Editor provides full support for important rule editing operations. GRA

N88-20899# Rochester Univ., NY. Dept. of Computer Science.
KNOWLEDGE RETRIEVAL AS SPECIALIZED INFERENCE
ALAN M. FRISCH May 1987 105 p
(Contract N00014-80-C-0197; NSF-DCR-83-51665)
(AD-A189042; TR-214) Avail: NTIS HC A06/MF A01 CSCL 12/9

Artificial intelligence reasoning systems commonly contain a large corpus of declarative knowledge, called a knowledge base

(KB), and provide facilities with which the system's components can retrieve this knowledge. Formal specifications that capture certain informal intuitions about retrieval are developed, studied, and implemented by retrieval algorithms. Consistent with the necessity for fast retrieval is the guiding intuition that a retriever is, at least in simple cases, a pattern matcher, though in more complex cases it may perform selected inferences such as property inheritance. The entire process of retrieval can be reviewed as a form of inference and hence the KB as a representation, not merely a data structure. A retriever makes a limited attempt to prove that a queried sentence is a logical consequence of the KB. When constrained by the no-chaining-restriction, inference becomes indistinguishable from pattern matching. Imagining the KB divided into quanta, a retriever that respects this restriction cannot combine two quanta in order to derive a third. The techniques of model theory will build non-procedural specifications of retrievability relations, which determine what sentences are retrievable from what KBs. Model-theoretic specifications are presented for four retrievers, each extending the capabilities of the previous one. GRA

N88-30352*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE SECOND GENERATION INTELLIGENT USER INTERFACE FOR THE CRUSTAL DYNAMICS DATA INFORMATION SYSTEM
NICHOLAS SHORT, JR. and SCOTT L. WATTAWA (Science Applications Research, Greenbelt, Md.) *In its* The 1988 Goddard Conference on Space Applications of Artificial Intelligence p 313-327 Aug. 1988
Avail: NTIS HC A19/MF A03 CSCL 05/2

For the past decade, operations and research projects that support a major portion of NASA's overall mission have experienced a dramatic increase in the volume of generated data and resultant information that is unparalleled in the history of the agency. The effect of such an increase is that most of the science and engineering disciplines are undergoing an information glut, which has occurred, not only because of the amount, but also because of the type of data being collected. This information glut is growing exponentially and is expected to grow for the foreseeable future. Consequently, it is becoming physically and intellectually impossible to identify, access, modify, and analyze the most suitable information. Thus, the dilemma arises that the amount and complexity of information has exceeded and will continue to exceed, using present information systems, the ability of all the scientists and engineers to understand and take advantage of this information. As a result of this information problem, NASA has initiated the Intelligent Data Management (IDM) project to design and develop Advanced Information Management Systems (AIMS). The first effort of the Project was the prototyping of an Intelligent User Interface (IUI) to an operational scientific database using expert systems, natural language processing, and graphics technologies. An overview of the IUI formulation and development for the second phase is presented. Author

N88-30375# Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
EXPLOITING LEXICAL REGULARITIES IN DESIGNING NATURAL LANGUAGE SYSTEMS
BORIS KATZ and BETH LEVIN Apr. 1988 25 p
(Contract N00014-85-K-0124)
(AD-A195922; AI-M-1041) Avail: NTIS HC A03/MF A01 CSCL 05/7

This paper presents the lexical component of the START Question Answering system developed at the MIT Artificial Intelligence Lab. START is able to interpret correctly a wide range of semantic relationships associated with alternate expressions of the arguments of verbs. The design of the system takes advantage of the results of recent linguistic research into the structure of the lexicon, allowing START to attain a broader range of coverage than many existing systems. It is concluded that the addition of a component that explicitly encodes verb classes and their characteristic properties, enables the START system to handle a wide range of phenomena reflecting semantic-syntactic correspondences that are characteristic of English verbs. By factoring properties that belong to whole classes of verbs out of the entries of individual verbs and letting these entries simply designate the verb's class membership, we do more than merely simplify entries. We facilitate the addition of new words to the lexicon and make it easier to extend the system's coverage of linguistic phenomena. GRA

N88-30449# Massachusetts Inst. of Tech., Cambridge.
KNOWLEDGE-BASED INTEGRATED INFORMATION SYSTEMS ENGINEERING: HIGHLIGHTS AND BIBLIOGRAPHY. KNOWLEDGE-BASED INTEGRATED INFORMATION SYSTEMS ENGINEERING (KBIISE) PROJECT, VOLUME 1 Final Report, Sep. 1986 - Jan. 1988
AMAR GUPTA, ed. and STUART MADNICK, ed. Dec. 1987 134 p Sponsored in part by the Department of the Air Force, Washington, D.C.
(Contract DTRS57-85-C-00083)
(AD-A195850; AD-E500978; MIT-KBIISE-1) Avail: NTIS HC A07/MF A01 CSCL 12/7

This volume presents the highlights of the Knowledge-Based Integrated Information Systems Engineering (KBIISE) project, an effort that focuses on identifying and understanding the key issues involved in the intelligent integration of large-scale distributed information systems. Underlying trends in the information technology area have led to a situation where most organizations depend on a portfolio of systems, ranging from mainframes to minicomputers, and from general purpose workstations to sophisticated CAD/CAM systems, to support their computational requirements. The large size of individual systems and the high degree of diversity between systems make the task of integrating islands of disparate information systems very formidable. The integration of existing system involves surmounting major technical and non-technical barriers which are described in the first part of this volume. The significance of these barriers is analyzed, and approaches for mitigating key problems are developed. Apart from the major issues of concurrency control and recovery in a heterogeneous computing environment, the technical analysis focuses on the subjects of logical connectivity and the use of expert systems technology to draw meaningful inferences in situations characterized by incomplete or conflicting information. The second part of this volume contains a comprehensive annotated bibliography of published papers and technical reports that relate to Knowledge-Based Integrated Information Systems. GRA

N88-30454# Massachusetts Inst. of Tech., Cambridge.
TECHNICAL OPINIONS REGARDING KNOWLEDGE-BASED INTEGRATED INFORMATION SYSTEMS ENGINEERING, VOLUME 8 Final Report, Sep. 1986 - Jan. 1988
AMAR GUPTA and STUART MADNICK Dec. 1987 339 p Sponsored in part by DOT, DOD, and AF
(Contract DTRS57-85-C-00083)
(AD-A195857; AD-E500978; MIT-KBIISE-8) Avail: NTIS HC A15/MF A02 CSCL 12/7

This volume encapsulates the views of a panel of experts drawn from government, industry and academia. It is divided into three parts. The first part, Record of discussions held at the first meeting of Technical Advisory Panel on February 17, 1987, highlights the most significant dimensions of Knowledge-Based Integrated Information Systems Engineering. The second part, Record of discussions held at the second meeting of Technical Advisory Panel on May 21, and 22, 1987, presents opinions in the areas of: Organization, Strategy, and Management; Distributed Database Technology; Knowledge and Semantics; and Information Modeling and Mapping. A framework for tackling the problems in these areas is also presented. The third part, Contributions by members of the Technical Advisory Panel (TAP), contains ten outstanding papers contributed by members of the TAP. The first set of three papers focuses on distributed databases. The second set of three papers concentrates on information modeling

alternatives. The final set of four papers examines a range of auxiliary issues in the context of large scale, distributed, heterogeneous information systems. GRA

N88-30455# Massachusetts Inst. of Tech., Cambridge.
KNOWLEDGE-BASED INTEGRATED INFORMATION SYSTEMS DEVELOPMENT METHODOLOGIES PLAN.
KNOWLEDGE-BASED INTEGRATED INFORMATION SYSTEMS ENGINEERING (KBIISE) REPORT, VOLUME 2 Final Report, Sep. 1986 - Jan. 1988
AMAR GUPTA, ed. and STUART MADNICK, ed. Dec. 1987 350 p Sponsored in part by the Department of the Air Force, Washington, D.C.
(Contract DTRS57-85-C-00083)
(AD-A195851; AD-E500978; MIT-KBIISE-2) Avail: NTIS HC A15/MF A02 CSCL 12/7

This volume describes the Integrated System Evolution Environment (IISEE) which is structured approach for the strategic planning, tactical planning, requirements definition, design, construction, implementation, and maintenance of large scale distributed, heterogeneous integrated information systems. This approach is designed to enable system developers in the Air Force and its contractor community to evolve their current systems into a unified framework. The overall goal of the IISEE thrust is to establish a structured systems development approach consisting of methodologies, methods, tools, techniques, and practices which can improve productivity of participants, and reduce cost and time required for integrated information systems development. The IISEE strategy has been designed keeping in view the objectives of the Integrated Design Support System (IDS) Program of the Air Force. The latter program encompasses all issues relating to capture, management, and communication of product technical data from its initial creation in design, through realization in manufacture, to logistics operations. GRA

N89-10096*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
ADVANCED DATA MANAGEMENT DESIGN FOR AUTONOMOUS TELEROBOTIC SYSTEMS IN SPACE USING SPACEBORNE SYMBOLIC PROCESSORS
ANDRE GOFORTH *In* NASA, Goddard Space Flight Center, Proceedings of 1987 Goddard Conference on Space Applications of Artificial Intelligence (AI) and Robotics 19 p 1987
Avail: NTIS HC A99/MF E03 CSCL 09/2

The use of computers in autonomous telerobots is reaching the point where advanced distributed processing concepts and techniques are needed to support the functioning of Space Station era telerobotic systems. Three major issues that have impact on the design of data management functions in a telerobot are covered. It also presents a design concept that incorporates an intelligent systems manager (ISM) running on a spaceborne symbolic processor (SSP), to address these issues. The first issue is the support of a system-wide control architecture or control philosophy. Salient features of two candidates are presented that impose constraints on data management design. The second issue is the role of data management in terms of system integration. This referes to providing shared or coordinated data processing and storage resources to a variety of telerobotic components such as vision, mechanical sensing, real-time coordinated multiple limb and end effector control, and planning and reasoning. The third issue is hardware that supports symbolic processing in conjunction with standard data I/O and numeric processing. A SSP that currently is seen to be technologically feasible and is being developed is described and used as a baseline in the design concept. Author

N89-10672# Massachusetts Inst. of Tech., Cambridge.
OBJECT-ORIENTED APPROACH TO INTEGRATING DATABASE SEMANTICS, VOLUME 4 Final Report, Sep. 1986 - Jan. 1988
AMAR GUPTA and STUART MADNICK Dec. 1987 298 p
(Contract DTRS57-85-C-00083)
(AD-A195853; AD-E500978; MIT-KBIISE-4) Avail: NTIS HC A13/MF A02 CSCL 12/7

This volume presents the idea of using an object-oriented rule-based approach to integrating database semantics. It is divided into three parts. The first part, An Actor's Role in Integrating Expert and Database Systems, presents arguments for various approaches for using expert system techniques in combination with database management systems and concludes by recommending an object-oriented approach. The second part, Interfacing Objects and Databases, describes the motivation, development, and usage of a prototype Knowledge Oriented Representation Language (KOREL) that uses an object-oriented approach for interfacing to existing database systems. KOREL is implemented in common LISP. One of the important features of KOREL is that it automatically retrieves data as needed from the underlying databases rather than snapshot the entire database. This improves performance and minimizes the impact of skew. The third part, A Knowledge-Based System for Resolving Semantic Conflicts: A Problem of Integrating Heterogeneous Database Management Systems, presents a comprehensive example of the integration of multiple databases. The application analyzed involves multiple tour guide databases which have overlapping information that is often ambiguous, contradictory, and incomplete. Various types of semantic conflicts are identified and approaches to their resolution are presented. A prototype system, based on the Knowledge Engineering Environment (KEE) software, is described. GRA

N89-11435# California Univ., San Diego, La Jolla.
THREE-DIMENSIONAL COMPUTER GRAPHICS BRAIN-MAPPING PROJECT Final Report, 10 Mar. - 24 Dec. 1987
ROBERT B. LIVINGSTON 24 Mar. 1988 151 p
(Contract DAMD17-86-C-6093)
(AD-A197053) Avail: NTIS HC A08/MF A01 CSCL 06/4

A core group was assembled at UCSD and the Scripps Clinic and Research Foundation, which, together with participating national advisors, could solve problems that stand in the way of engaging computer graphics and database management more effectively in the solution of neurosciences problems. We aimed at improving the interface between neuroanatomy and computer graphics systems so that the groundwork for accurate quantitative morphology will be satisfactory from the neurosciences viewpoint in proceeding to achieve whole brain reconstructions. We have succeeded in developing sound methods for preparing whole brains for sectioning and microscopic analysis, with controls for reducing brain distortions in three dimensions and for correcting the inevitable distortions that accompany slicing brain tissue at microscopic intervals, for combining structure/function data, and for beginning an analysis of whole brain tissue sections at microscopic levels of detail. GRA

N89-12294# Syracuse Univ., NY. Electrical and Computer Engineering.
COMPUTER ARCHITECTURES FOR VERY LARGE KNOWLEDGE BASES
P. BRUCE BERRA *In its* Northeast Artificial Intelligence Consortium (NAIC). Review of Technical Tasks, Volume 2, Part 2 p 835-851 Jul. 1987
Avail: NTIS HC A21/MF A03 CSCL 09/2

The current state of the art in knowledge based expert systems is such that the intensional database (IDB) of rules and the extensional database of facts (EDB) are small and main memory resident. The goal of this reseach is to develop innovative computer architectures that efficiently manage very large knowledge bases in a real time environment. There are many ways to represent knowledge in an expert system. A logic programming framework was chosen because of its strong mathematical foundation, its commonality with relational data base management, prior and current Prolog and MetaProlog work and the potential for making significant improvements in the performance of logic programs through the exploitation of search parallelism. A description is provided of the partial match retrieval problem that results when one seeks to retrieve facts from EDB. The approach to the

improvement of the performance of the partial match retrieval problem is then discussed along with an initial computer architecture. Author

N89-12295# Syracuse Univ., NY. Logic Programming Research Group.
KNOWLEDGE BASE MAINTENANCE USING LOGIC PROGRAMMING METHODOLOGIES
KENNETH A. BOWEN *In its* Northeast Artificial Intelligence Consortium (NAIC). Review of Technical Tasks, Volume 2, Part 2 p 853-858 Jul. 1987
Avail: NTIS HC A21/MF A03 CSCL 09/2

The development of extensions of the logic programming language Prolog which are suitable for application to the problem of maintaining consistency and logical structure for large dynamic knowledge bases is discussed. The logical representation of the assertions of a knowledge base is to identify them with the facts and rules of the logic programming language. So-called metalevel extensions of Prolog are being developed. The metalevel extensions have the character that logical concepts which are implicit in Prolog systems are made explicit in the extension. In particular, theories, which are only implicit in Prolog, become explicit first-clase objects capable of being the values of variables and of being dynamically constructed and modified in a logical manner. While the immediate motivation for the reification of theories was the representation of change in knowledge bases, a pleasant side-effect is the ability to clearly implement a number of classical artificial intelligence knowledge representation schemes such as frames and semantic nets. A similar approach is being taken to the problem of control. Author

N89-13188# Colgate Univ., Hamilton, NY.
PLANNER SYSTEM FOR THE APPLICATION OF INDICATIONS AND WARNING
SERGEI NIRENBURG *In* Syracuse Univ., N. Y. Northeast Artificial Intelligence Consortium (NAIC). Review of Technical Tasks, Volume 2, Part 1 p 277-326 Jul. 1987
Avail: NTIS HC A21/MF A03 CSCL 09/2

A planner system for the application of indications and warning (A and I) is designed. The task of the project is two-pronged: obtain as input messages concerning events in a model of a real-life subworld; understand these events by detecting what plans they are part of and, whenever applicable, what goals are pursued; and produce (suggestion for possible) plans of action necessary in connection with the suituation in the world. Author

N89-13191# Massachusetts Univ., Amherst. Dept. of Computer and Information Science.
PLAN RECOGNITION, KNOWLEDGE ACQUISITION AND EXPLANATION IN AN INTELLIGENT INTERFACE Year End Report, 1984 - 1985
VICTOR LESSER, W. BRUCE CROFT, and BEVERLY WOOLF *In* Syracuse Univ., N. Y. Northeast Artificial Intelligence Consortium (NAIC). Review of Technical Tasks, Volume 2, Part 1 p 375-466 Jul. 1987
Avail: NTIS HC A21/MF A03 CSCL 09/2

The primary focus was to support users in their interactions with an intelligent database and with each other, in a case of a distributed interface. The research effort has two complementary aims: development of a planner, plan recognizer, and associated database that knows about the user tasks and can begin to automate execution of the tasks; and development of intelligent interface tools, such as natural language parsers and generators, and graphics facilities, to increase a user's ability to interact with the system. Both efforts are directed at enabling a machine to provide assistance to a user while describing its own actions and decisions. The achievements for fiscal year 1984 to 1985 are outlined. Author

N89-13915# Harvard Univ., Cambridge, MA.
ARTIFICIAL INTELLIGENCE TECHNIQUES FOR RETROSPECTIVE HELP IN DATA ANALYSIS
WILLIAM H. NUGENT *In* Colorado State Univ., Computer Science and Statistics. Proceedings of the 18th Symposium on the Interface p 118-121 26 Aug. 1987 Sponsored in part by ONR, Washington, D.C.
Avail: NTIS HC A20/MF A03 CSCL 12/6

A tool is presented which has been developed to address the meta problem of script analysis - the determining of the definitions and interdependencies of commands and variables. This is a natural area to automate for three reasons: (1) searching through a script to find a variable or command reference is a tedious process; (2) an analyst makes mistakes when searching manually through the script; and (3) researchers have proven A.I. technology which can be applied to this problem. Author

N89-14709# Sandia National Labs., Albuquerque, NM.
THE NC (NUMERICALLY CONTROLLED) ASSISTANT: INTERFACING KNOWLEDGE BASED MANUFACTURING TOOLS TO CAO/CAM SYSTEMS
W. C. BURD 1988 34 p Presented at the CIM SUBWOG 39E Meeting, Cardiff, United Kingdom, 6 Oct. 1986
(Contract DE-AC04-76DP-00789)
(DE88-016742; SAND-88-2088C; CONF-8610203-2) Avail: NTIS HC A03/MF A01

A knowledge based computer program that assists programmers of numerically controlled (NC) machine tools is described. The program uses part features identified by the NC programmer and a set of expert system manufacturing rules to select cutting parameters and produce NC part programs. An expert system shell determines the NC sequence and the machining parameters. Several point-to-point NC functions are currently in production. A CAD/CAM system interface for milling and turning functions is also described. DOE

N89-14768# FMC Corp., Santa Clara, CA. Central Engineering Labs.
SYSTEM INTEGRATION OF KNOWLEDGE-BASED MAINTENANCE AIDS
CHRISTOPHER A. POWELL, CYNTHIA K. PICKERING, and KEITH T. WESCOURT *In* Colorado Univ., Proceedings of the Air Force Workshop on Artificial Intelligence Applications for Integrated Diagnostics p 440-451 Jul. 1987 Submitted for publication
Avail: NTIS HC A23/MF A03 CSCL 12/9

There are many examples of knowledge-based fault diagnosis advisors for corrective maintenance of complex equipment. However, such advisors are only part of an overall maintenance solution. To be used effectively, diagnostic advisors must be integrated with other existing and forthcoming systems, such as Automated Test Equipment and maintenance databases. Successful fielding of knowledge-based systems requires consideration of integration issues throughout the design process. Author

N89-14957*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
KNOWLEDGE BASED SYSTEMS: A CRITICAL SURVEY OF MAJOR CONCEPTS, ISSUES, AND TECHNIQUES M.S. Thesis Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. and SRINU KAVI 11 Dec. 1984 324 p Prepared in cooperation with Southern Univ., Baton Rouge, LA
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184517; NAS 1.26:184517; DBMS.NASA/RECON-9)
Avail: NTIS HC A14/MF A02 CSCL 05/2

This Working Paper Series entry presents a detailed survey of knowledge based systems. After being in a relatively dormant state for many years, only recently is Artificial Intelligence (AI) - that branch of computer science that attempts to have machines emulate intelligent behavior - accomplishing practical results. Most of these results can be attributed to the design and use of Knowledge-Based Systems, KBSs (or ecpert systems) - problem solving computer programs that can reach a level of performance comparable to that of a human expert in some specialized problem domain. These systems can act as a consultant for various requirements like medical diagnosis, military threat analysis, project

risk assessment, etc. These systems possess knowledge to enable them to make intelligent desisions. They are, however, not meant to replace the human specialists in any particular domain. A critical survey of recent work in interactive KBSs is reported. A case study (MYCIN) of a KBS, a list of existing KBSs, and an introduction to the Japanese Fifth Generation Computer Project are provided as appendices. Finally, an extensive set of KBS-related references is provided at the end of the report. Author

N89-14958*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
KNOWLEDGE BASED SYSTEMS: A CRITICAL SURVEY OF MAJOR CONCEPTS, ISSUES AND TECHNIQUES. VISUALS
Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. and SRINU KAVI 11 Dec. 1984 67 p Prepared in cooperation with Southern Univ., Baton Rouge, LA
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184518; NAS 1.26:184518; DBMS.NASA/RECON-10)
Avail: NTIS HC A04/MF A01 CSCL 05/2

This Working Paper Series entry represents a collection of presentation visuals associated with the companion report entitled, Knowledge Based Systems: A Critical Survey of Major Concepts, Issues, and Techniques, USL/DBMS NASA/RECON Working Paper Series report number DBMS.NASA/RECON-9. The objectives of the report are to: examine various techniques used to build the KBS; to examine at least one KBS in detail, i.e., a case study; to list and identify limitations and problems with the KBS; to suggest future areas of research; and to provide extensive reference materials. Author

N89-14969*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
KARL: A KNOWLEDGE-ASSISTED RETRIEVAL LANGUAGE
M.S. Thesis Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. and SPIROS TRIANTAFYLLOPOULOS 31 Oct. 1985 158 p prepared in cooperation with Southern Univ., Baton Rouge, LA
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184529; NAS 1.26:184529; DBMS.NASA/RECON-21)
Avail: NTIS HC A08/MF A01 CSCL 05/2

Data classification and storage are tasks typically performed by application specialists. In contrast, information users are primarily non-computer specialists who use information in their decision-making and other activities. Interaction efficiency between such users and the computer is often reduced by machine requirements and resulting user reluctance to use the system. This thesis examines the problems associated with information retrieval for non-computer specialist users, and proposes a method for communicating in restricted English that uses knowledge of the entities involved, relationships between entities, and basic English language syntax and semantics to translate the user requests into formal queries. The proposed method includes an intelligent dictionary, syntax and semantic verifiers, and a formal query generator. In addition, the proposed system has a learning capability that can improve portability and performance. With the increasing demand for efficient human-machine communication, the significance of this thesis becomes apparent. As human resources become more valuable, software systems that will assist in improving the human-machine interface will be needed and research addressing new solutions will be of utmost importance. This thesis presents an initial design and implementation as a foundation for further research and development into the emerging field of natural language database query systems. Author

N89-15559*# Alabama A & M Univ., Huntsville. Dept. of Computer and Information Science.
PLANNING ACTIONS IN ROBOT AUTOMATED OPERATIONS
A. DAS *In* NASA, Marshall Space Flight Center, Fourth Conference on Artificial Intelligence for Space Applications p 69-74 Oct. 1988
Avail: NTIS HC A21/MF A03 CSCL 09/2

Action planning in robot automated operations requires intelligent task level programming. Invoking intelligence necessiates a typical blackboard based architecture, where, a plan is a vector between the start frame and the goal frame. This vector is composed of partially ordered bases. A partial ordering of bases presents good and bad sides in action planning. Partial ordering demands the use of a temporal data base management system. Author

N89-15574*# Martin Marietta Aerospace, New Orleans, LA. Manned Space Systems.
CASE-BASED REASONING: THE MARRIAGE OF KNOWLEDGE BASE AND DATA BASE
KIRT PULASKI and CYPRIAN CASADABAN *In* NASA, Marshall Space Flight Center, Fourth Conference on Artificial Intelligence for Space Applications p 183-190 Oct. 1988
Avail: NTIS HC A21/MF A03 CSCL 05/2

The coupling of data and knowledge has a synergistic effect when building an intelligent data base. The goal is to integrate the data and knowledge almost to the point of indistinguishability, permitting them to be used interchangeably. Examples given in this paper suggest that Case-Based Reasoning is a more integrated way to link data and knowledge than pure rule-based reasoning. Author

N89-15585*# Prospective Computer Analysts, Inc., Arlington, VA.
AUTOMATED KNOWLEDGE BASE DEVELOPMENT FROM CAD/CAE DATABASES
R. GLENN WRIGHT and MARY BLANCHARD *In* NASA, Marshall Space Flight Center, Fourth Conference on Artificial Intelligence for Space Applications p 253-260 Oct. 1988
Avail: NTIS HC A21/MF A03 CSCL 05/2

Knowledge base development requires a substantial investment in time, money, and resources in order to capture the knowledge and information necessary for anything other than trivial applications. This paper addresses a means to integrate the design and knowledge base development process through automated knowledge base development from CAD/CAE databases and files. Benefits of this approach include the development of a more efficient means of knowledge engineering, resulting in the timely creation of large knowledge based systems that are inherently free of error. Author

N89-15607*# Aerospace Corp., Los Angeles, CA. Space Sciences Lab.
SPACECRAFT ENVIRONMENTAL ANOMALIES EXPERT SYSTEM
H. C. KOONS and D. J. GORNEY *In* NASA, Marshall Space Flight Center, Foruth Conference on Artificial Intelligence for Space Applications p 457-465 Oct. 1988
Avail: NTIS HC A21/MF A03 CSCL 22/2

A microcomputer-based expert system is being developed at the Aerospace Corporation Space Sciences Laboratory to assist in the diagnosis of satellite anomalies caused by the space environment. The expert system is designed to address anomalies caused by surface charging, bulk charging, single event effects and total radiation dose. These effects depend on the orbit of the satellite, the local environment (which is highly variable), the satellite exposure time and the hardness of the circuits and components of the satellite. The expert system is a rule-based system that uses the Texas Instruments Personal Consultant Plus expert system shell. The completed expert system knowledge base will include 150 to 200 rules, as well as a spacecraft attributes database, an historical spacecraft anomalies database, and a space environment database which is updated in near real-time. Currently, the expert system is undergoing development and testing within the Aerospace Corporation Space Sciences Laboratory. Author

N89-16368*# Houston Univ., Clear Lake, TX.
RDESIGN: A DATA DICTIONARY WITH RELATIONAL DATABASE DESIGN CAPABILITIES IN ADA
ANTHONY A. LEKKOS and TERESA TING-YIN KWOK *In* NASA, Lyndon B. Johnson Space Center, First International Conference

on Ada (R) Programming Language Applications for the NASA Space Station, Volume 2 7 p 1986
Avail: NTIS HC A22/MF A03 CSCL 09/2

Data Dictionary is defined to be the set of all data attributes, which describe data objects in terms of their intrinsic attributes, such as name, type, size, format and definition. It is recognized as the data base for the Information Resource Management, to facilitate understanding and communication about the relationship between systems applications and systems data usage and to help assist in achieving data independence by permitting systems applications to access data knowledge of the location or storage characteristics of the data in the system. A research and development effort to use Ada has produced a data dictionary with data base design capabilities. This project supports data specification and analysis and offers a choice of the relational, network, and hierarchical model for logical data based design. It provides a highly integrated set of analysis and design transformation tools which range from templates for data element definition, spreadsheet for defining functional dependencies, normalization, to logical design generator. Author

N89-16400# National Academy of Sciences - National Research Council, Washington, DC.
PROCEEDINGS OF THE WORKSHOP ON AI (ARTIFICIAL INTELLIGENCE), AND DISTRIBUTED PROBLEM SOLVING
May 1985 174 p Workshop held at Washington, DC, 16-17 May 1985 Prepared for ONR, Arlington, VA
(PB88-224852) Avail: NTIS HC A08/MF A01 CSCL 09/2

Several topics in artificial intelligence are discussed. Military needs, distributed problem solving and reasoning, and information fusion are discussed.

N89-19123# Martingale Research Corp., Allen, TX.
BIOMASSCOMP: ARTIFICIAL NEURAL NETWORKS AND NEUROCOMPUTERS Final Report, 18 Aug. 1987 - 18 Feb. 1988
ROBERT L. DAWES Sep. 1988 196 p
(Contract F33615-87-C-1491)
(AD-A200902; MRC-WPAFB-88-001; AFWAL-TR-88-1076) Avail: NTIS HC A09/MF A02 CSCL 23/3

BIOMASSCOMP is a project whose objective is to define and develop methods for automating the process of reverse engineering the brain for application to the development of intelligent sensors and controllers for avionic and other systems. Concepts which many neural network and cognitive researchers have assumed to work in self- organizing systems are quantified and applied. During this Phase 1 SBIR project, an entropy-based scalar measure, DMORPH,of the common structure between two systems, as evidenced by measurement of signals from the two systems, have been defined, developed, and implemented. By design, DMORPH reflects only the crosscorrelations between systems and not the intracorrelations within the separate systems. DMORPH was applied to the input and output signals from various artificial neural network architectures to attempt to determine which networks, and which parameter settings within each, induced the greatest structural similarity between input and output signals after learning had taken place. This research applies to the development and testing of real time autonomous learning systems suitable for application to problems of avionics sensor fusion, adaptive sensor processing, and intelligent resource management. GRA

N89-19841*# Mitre Corp., McLean, VA. Artificial Intelligence Technical Center.
AN ARCHITECTURE FOR INTEGRATING DISTRIBUTED AND COOPERATING KNOWLEDGE-BASED AIR FORCE DECISION AIDS
RICHARD O. NUGENT and RICHARD W. TUCKER *In* NASA. Lyndon B. Johnson Space Center, 2nd Annual Workshop on Space Operations Automation and Robotics (SOAR 1988) p 171-175 Nov. 1988
(Contract F19628-86-C-0001)
Avail: NTIS HC A22/MF A04 CSCL 09/2

MITRE has been developing a Knowledge-Based Battle Management Testbed for evaluating the viability of integrating independently-developed knowledge-based decision aids in the Air Force tactical domain. The primary goal for the testbed architecture is to permit a new system to be added to a testbed with little change to the system's software. Each system that connects to the testbed network declares that it can provide a number of services to other systems. When a system wants to use another system's service, it does not address the server system by name, but instead transmits a request to the testbed network asking for a particular service to be performed. A key component of the testbed architecture is a common database which uses a relational database management system (RDBMS). The RDBMS provides a database update notification service to requesting systems. Normally, each system is expected to monitor data relations of interest to it. Alternatively, a system may broadcast an announcement message to inform other systems that an event of potential interest has occurred. Current research is aimed at dealing with issues resulting from integration efforts, such as dealing with potential mismatches of each system's assumptions about the common database, decentralizing network control, and coordinating multiple agents. Author

N89-20285*# Rice Univ., Houston, TX. Dept. of Chemical Engineering.
AN EXPERT SYSTEM BASED INTELLIGENT CONTROL SCHEME FOR SPACE BIOREACTORS
KA-YIU SAN *In* NASA, Washington, Microgravity Science and Applications Flight Programs, January - March 1987, Selected Papers, Volume 1 p 159-162 Oct. 1988
Avail: NTIS HC A21/MF A03 CSCL 22/1

An expert system based intelligent control scheme is being developed for the effective control and full automation of bioreactor systems in space. The scheme developed will have the capability to capture information from various resources including heuristic information from process researchers and operators. The knowledge base of the expert system should contain enough expertise to perform on-line system identification and thus be able to adapt the controllers accordingly with minimal human supervision. Author

N89-20574# Los Alamos National Lab., NM. Computing and Communications Div.
APPLYING EXPERTISE TO DATA IN THE GEOLOGIST'S ASSISTANT EXPERT SYSTEM
K. P. BERKBIGLER, G. J. PAPCUN, N. L. MARUSAK, and J. E. HUTSON 1988 9 p Presented at the 3rd Topical Meeting on Robotics and Remote Systems, Charleston, SC, 13 Mar. 1989
(Contract W-7405-ENG-36)
(DE89-003483; LA-UR-88-3750; CONF-890304-12) Avail: NTIS HC A02/MF A01

The Geologist's Assistant combines expert system technology with numerical pattern-matching and online communication to a large database. This paper discusses the types of rules used for the expert system, the pattern-matching technique applied, and the implementation of the system using a commercial expert system development environment. DOE

N89-20694*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
USE OF ARTIFICIAL INTELLIGENCE IN SUPERVISORY CONTROL
AARON COHEN and JON D. ERICKSON *In* Georgia Inst. of Tech., Human-Computer Interaction in Distributed Supervisory Control Tasks 48 p Jan. 1989
Avail: NTIS HC A08/MF A01 CSCL 09/2

Viewgraphs describing the design and testing of an intelligent decision support system called OFMspert are presented. In this expert system, knowledge about the human operator is represented through an operator/system model referred to as the OFM (Operator Function Model). OFMspert uses the blackboard model of problem solving to maintain a dynamic representation of operator goals, plans, tasks, and actions given previous operator actions and current system state. Results of an experiment to assess

OFMspert's intent inferencing capability are outlined. Finally, the overall design philosophy for an intelligent tutoring system (OFMTutor) for operators of complex dynamic systems is summarized. M.G.

N89-23132# SRI International Corp., Menlo Park, CA. Artificial Intelligence Center.
CORE KNOWLEDGE SYSTEM: STORAGE AND RETRIEVAL OF INCONSISTENT INFORMATION
THOMAS M. STRAT and GRAHAME B. SMITH *In* Science Applications International Corp., Proceedings: Image Understanding Workshop, Volume 2 p 660-665 Apr. 1988
Avail: NTIS HC A99/MF E03 CSCL 05/2

An information storage and retrieval mechanism that avoids the requirement of consistency maintenance imposed by tradition knowledge-based systems is described. By viewing data as opinions rather than facts, the system is able to combine knowledge that is generally accepted as being true with data that may be from unreliable sources. A formal account of the semantics of the approach is also given. The information management system described has been implemented and used to store information derived from image processing along with opinions from other sources about objects in the visible world. It appears to be well suited for the requirements of an autonomous robot, and for information storage in general. Author

N89-24070# TRW Defense Systems Group, Fairfax, VA. Systems Div.
ADVANCED COMPUTING SYSTEMS: AN ADVANCED REASONING-BASED DEVELOPMENT PARADIGM FOR ADA TRUSTED SYSTEMS AND ITS APPLICATION TO MACH
Quarterly Status Report, No. 1, 28 Nov. 1988 - 28 Feb. 1989
15 Mar. 1989 95 p
(Contract MDA972-89-C-0029; ARPA ORDER 6414)
(AD-A206308) Avail: NTIS HC A05/MF A01 CSCL 12/7

Objectives and basis of the process model; motivations (drivers) and constraints of the process model; an overview of primary risk issues; elements of the process model; and process model in the lifecycle are discussed. GRA

N89-24226# Naval Postgraduate School, Monterey, CA.
A PROGRAM INTERFACE PROTOTYPE FOR A MULTIMEDIA DATABASE INCORPORATING IMAGES M.S. Thesis
CATHY A. THOMAS Dec. 1988 120 p
(AD-A206439) Avail: NTIS HC A06/MF A01 CSCL 12/5

This thesis represents one aspect of an exploration of the integration of unformatted data types, such as image, sound and signal, with more conventional formatted types in a single database. The focus of this thesis is the implementation of a prototype of a database employing a relational model that incorporates both formatted and unformatted data types. Initial research was limited to integration of image data. The prototype provides storage and retrieval capabilities, as well as a modest query handling capability. GRA

N89-24847# Martin Marietta Labs., Baltimore, MD. Artificial Intelligence Group.
ON DESIGNING A CASE-BASED SYSTEM FOR EXPERT PROCESS DEVELOPMENT Abstract Only
SERAJ BHARWANI, J. T. WALLS, and M. E. JACKSON *In* Tactical Weapons Guidance and Control Information Conference on Space and Military Applications of Automation and Robotics p 55-57 Jun. 1988 Prepared in cooperation with Martin Marietta Corp., Huntsville, AL
Avail: NTIS HC A05/MF A01 CSCL 09/2

In artificial intelligence literature, using prior experience to help solve new problem situations is termed case-based reasoning. Using case-based reasoning was proposed for learning new concepts in mathematics, for clinical problem solving, for settling legal issues based on common law, and for interpreting and resolving common sense disputes. The need for such reasoning in preforming process development tasks was discussed. In particular, the significance of compiling case histories to capture critical process knowledge and the methods of compiling and reasoning with such histories to reduce process development time and enhance its reliability were described. This approach is especially useful in situations where existing processes are modified in response to frequent product changes or when processes developed for a prototype operation have to be ported to production systems. Author

N89-25774# Oak Ridge National Lab., TN. Information Research and Analysis.
AN EXPERT SYSTEM TO FACILITATE SELECTING A DATABASE MANAGEMENT SYSTEM
L. M. ROSEBERRY and D. C. KILGORE Jun. 1989 7 p Presented at the DOE Technical Information Meeting: INFOTECH, Oak Ridge, TN, 6 Jun. 1989
(Contract DE-AC05-84OR-21400)
(DE89-012350; CONF-8906113-2) Avail: NTIS HC A02/MF A01

An investigation has been initiated to develop an expert system to assist information professionals in selecting a database management system (DBMS). The system attempts to consider DBMS basic design, theory, and performance standard as well as the specific needs of the project. The user is queried for needs, wants, and resource restrictions. The inference engine tests these data against its rule set and generates prioritized recommendations. The rule set design will be discussed. The usefulness of such a tool will be discussed as well as plans for its continued evolution. DOE

N89-26578*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE 1989 GODDARD CONFERENCE ON SPACE APPLICATIONS OF ARTIFICIAL INTELLIGENCE
JAMES RASH, ed. Washington Apr. 1989 385 p Conference held in Greenbelt, MD, 16-17 May 1989
(NASA-CP-3033; REPT-89B00099; NAS 1.55:3033) Avail: NTIS HC A17/MF A03 CSCL 09/2

The following topics are addressed: mission operations support; planning and scheduling; fault isolation/diagnosis; image processing and machine vision; data management; and modeling and simulation.

N89-26599*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE UTILIZATION OF NEURAL NETS IN POPULATING AN OBJECT-ORIENTED DATABASE
WILLIAM J. CAMPBELL, SCOTT E. HILL, and ROBERT F. CROMP *In its* The 1989 Goddard Conference on Space Applications of Artificial Intelligence p 249-263 Apr. 1989
Avail: NTIS HC A17/MF A03 CSCL 09/2

Existing NASA supported scientific data bases are usually developed, managed and populated in a tedious, error prone and self-limiting way in terms of what can be described in a relational Data Base Management System (DBMS). The next generation Earth remote sensing platforms (i.e., Earth Observation System, (EOS), will be capable of generating data at a rate of over 300 Mbs per second from a suite of instruments designed for different applications. What is needed is an innovative approach that creates object-oriented databases that segment, characterize, catalog and are manageable in a domain-specific context and whose contents are available interactively and in near-real-time to the user community. Described here is work in progress that utilizes an artificial neural net approach to characterize satellite imagery of undefined objects into high-level data objects. The characterized data is then dynamically allocated to an object-oriented data base where it can be reviewed and assessed by a user. The definition, development, and evolution of the overall data system model are steps in the creation of an application-driven knowledge-based scientific information system. Author

N89-26600*# Martin Marietta Corp., Denver, CO. Information and Communications Systems.
A RAPID PROTOTYPING/ARTIFICIAL INTELLIGENCE APPROACH TO SPACE STATION-ERA INFORMATION MANAGEMENT AND ACCESS
RICHARD S. CARNAHAN, JR., STEPHEN M. COREY, and JOHN B. SNOW *In* NASA. Goddard Space Flight Center, The 1989 Goddard Conference on Space Applications of Artificial Intelligence p 265-279 Apr. 1989
Avail: NTIS HC A17/MF A03 CSCL 09/2

Applications of rapid prototyping and Artificial Intelligence techniques to problems associated with Space Station-era information management systems are described. In particular, the work is centered on issues related to: (1) intelligent man-machine interfaces applied to scientific data user support, and (2) the requirement that intelligent information management systems (IIMS) be able to efficiently process metadata updates concerning types of data handled. The advanced IIMS represents functional capabilities driven almost entirely by the needs of potential users. Space Station-era scientific data projected to be generated is likely to be significantly greater than data currently processed and analyzed. Information about scientific data must be presented clearly, concisely, and with support features to allow users at all levels of expertise efficient and cost-effective data access. Additionally, mechanisms for allowing more efficient IIMS metadata update processes must be addressed. The work reported covers the following IIMS design aspects: IIMS data and metadata modeling, including the automatic updating of IIMS-contained metadata, IIMS user-system interface considerations, including significant problems associated with remote access, user profiles, and on-line tutorial capabilities, and development of an IIMS query and browse facility, including the capability to deal with spatial information. A working prototype has been developed and is being enhanced. Author

THE HUMAN INTERFACE

As applied by IRM, hardware and software comprising current information technology is run by people trying to make it do what they want done. And of course people themselves are major information resources. Balancing people and technology is a major concern in the management of information resources.

A84-19282
FLIGHT STATIONS AND OFFICES OF THE FUTURE - HOW SIMILAR WILL THEY BE
R. L. WASSON (Sperry Corp., Blue Bell, PA) IN: Human Factors Society, Annual Meeting, 27th, Norfolk, VA, October 10-14, 1983, Proceedings. Volume 1. Santa Monica, CA, Human Factors Society, 1983, p. 85-88.
Copyright

Information creation and management are starting to become the major task elements for both the office worker and the pilot. The computer technology which is enabling this will not only improve performance but will lead to greater user satisfaction. Research has been ongoing in both of these work environments. Human factors personnel engaged in either area can benefit form an increased sharing of their respective achievements. Author

A84-32429
THE MAN-MACHINE INTERFACE IN COMPUTERIZED TELEMETRY SYSTEMS
T. F. REBER (New Mexico State University, Las Cruces, NM) IN: ITC/USA/'82; Proceedings of the International Telemetering Conference, San Diego, CA, September 28-30, 1982. Research Triangle Park, NC, Instrument Society of America, 1982, p. 527-531.
Copyright

A friendly menu-driven computer interface has been developed for a telemetry ground station to simplify the process of data retrieval. The interface consists of software designed to present telemetry system options to an operator for selection. The options are displayed on the operator's CRT in telemetry language to allow telemetry operators to configure the equipment setup and the data processing parameters. Once the configuration has been defined, the system can be configured quickly and precisely by the computer software. Changes in the setup or data processing configuration can be made by the operator without the help of skilled programmers. V.L.

A84-44671
COMPUTER SOFTWARE FOR WORKING WITH LANGUAGE
T. WINOGRAD (Stanford University, Stanford, CA) Scientific American (ISSN 0036-8733), vol. 251, Sept. 1984, p. 130-133, 135 (7 ff.).
Copyright

Investigators are developing unified theories of computation which embrace both natural and artificial languages. Attention is presently given to the characteristics of natural language programs which attempt to work with word meanings, and with the difficulties arising from the ambiguity of human languages. The forms that ambiguity can take encompass: (1) the lexical, where a given word has more than one meaning; (2) structural ambiguity, in which a given sentence has two possible grammatical structures; (3)'deep structure' ambiguity, in which two readings of a sentence have the same apparent grammatical structure but different meanings; (4) semantic ambiguity, by means of which a phrase can play different roles in the overall meaning of a sentence; and (5) pragmatic ambiguity, arising from the use of pronouns and special nouns such as 'one' and 'another'. The key problems in designing word processing software center on issues of representation and interaction, where the latter devises data structures that can be manipulated by software and the latter decides how the user expresses instructions and the manner in which the system responds. O.C.

A84-44751
THE FLIGHT SERVICE AUTOMATION SYSTEM
J. T. REHMANN (FAA, Technical Center, Atlantic City, NY) IN: Air Traffic Control Association, Annual Fall Conference, 27th, Atlantic City, NJ, October 18-21, 1982, Proceedings. Arlington, VA, Air Traffic Control Association, 1982, p. 307-312.
Copyright

Results of an evaluation of selected functions of the Flight Service Automation System (FSAS), Model 2, are presented. The FSAS provides a means of rapid information retrieval as well as continuously updated graphics and radar products. Flight and weater data are processed and stored in computers for immediate call-up on CRT displays. The evaluation, which has been performed in the laboratory under conditions closely simulating actual operation conditions, has prompted changes to several messages to improve their effectiveness. The advantages of the evaluations of this kind are discussed, with particular attention given to data distribution and optimal human factor design. V.L.

A85-17865*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
AN ADVANCED MEDIA INTERFACE FOR CONTROL OF MODERN TRANSPORT AIRCRAFT NAVIGATIONAL SYSTEMS
D. R. JONES, R. V. PARRISH, L. H. PERSON, JR. (NASA, Langley Research Center, Hampton, VA), and J. L. OLD (Research Triangle Institute, Research Triangle Park, NC) IN: Digital Avionics Systems Conference, 6th, Baltimore, MD, December 3-6, 1984, Proceedings. New York, American Institute of Aeronautics and Astronautics, 1984, p. 421-428. refs
(AIAA PAPER 84-2686)

With the advent of digital avionics, the workload of the pilot in a moderen transport aircraft is increasing significantly. This situation makes it necessary to reduce pilot workload with the aid of new advanced technologies. As part of an effort to improve information management systems, NASA has, therefore, studied an advanced concept for managing the navigational tasks of a modern transport

aircraft. This concept is mainly concerned with the simplification of the pilot interface. The advanced navigational system provides a simple method for a pilot to enter new waypoints to change his flight plan because of heavy traffic, adverse weather conditions, or other reasons. The navigational system was implemented and evaluated in a flight simulator representative of a modern transport aircraft. Attention is given to the simulator, flight simulation, multimode devices, and the navigational system. G.R.

A85-43401
AN APPROACH TO USER SPECIFICATION OF INTERACTIVE DISPLAY INTERFACES
L. J. BASS (Rhode Island, University, Kingston) IEEE Transactions on Software Engineering (ISSN 0098-5589), vol. SE-11, Aug. 1985, p. 686-698. refs
Copyright

The interaction of the end user of a database system with a computer terminal typically is related to the examination, input, modification, or analysis of the data. General purpose techniques have been developed to assist in the management of the user interface. There are dialog systems, general screen systems, and form managers. The integration of the form concept into dialog systems and the use of forms by arbitrary application programs has been inhibited by the unitary nature of forms. This paper presents a form as the realization of a collection of components. These components are connected by means of logic which is a portion of the form specification. Higher level constructs such as repeated fields and aggregation are handled through a hierarchy of the form components. Attention is given to the example of a report, aspects of grouping, the theory of the display system, theoretical considerations, screen management, operators, and problems of implementation. G.R.

A86-21889
INTELLIGENT INTERFACES FOR HUMAN CONTROL OF ADVANCED AUTOMATION AND SMART SYSTEMS
A. M. MADNI and A. FREEDY (Perceptronics, Inc., Woodland Hills, CA) IN: EASCON '84; Proceedings of the Seventeenth Annual Electronics and Aerospace Conference, Washington, DC, September 10-12, 1984. New York, Institute of Electrical and Electronics Engineers, 1984, p. 227-232. refs
Copyright

Today, an important part of robotics research is directed toward the development of intelligent systems which are capable of performing and/or cooperating with the human operator in some of the higher level cognitive functions. The present paper is concerned with the need to incorporate an 'Intelligent Interface' (II) in the considered systems. It is the objective of the II to maximize the performance of an operator-robot system for a given degree of intelligence of the robot and a given level of operator capability. Attention is given to the specific goals of the II, its design architecture, information management aids, tailored feedback, high-level command and query languages, explanation facility, operator-robot task allocation, personalized responses, task performance monitoring and contingency handling, and default responses in structured situations. G.R.

A86-23740
EXAMINE - AN EXPERT SYSTEM TO MEDIATE HUMAN-COMPUTER DIALOGS
R. J. PETERSEN, T. HESTER, and J. P. YORCHAK (Martin Marietta Corp., Denver, CO) IN: Human Factors Society, Annual Meeting, 28th, San Antonio, TX, October 22-26, 1984, Proceedings. Volume 2. Santa Monica, CA, Human Factors Society, 1984, p. 889-893 refs
Copyright

An EXpertly Assisted Man-machine Interface for Network Environments (EXAMINE) will assist users of large heterogeneous database networks. EXAMINE is specified to be a layered man-computer interface. Due to the requirement that the system must be adaptive to the user and the context derived from the user's information environment, expert system technology is being applied. This paper describes the user's problems in using distributed heterogeneous database networks and some of the details of EXAMINE functionality to solve these problems. Author

A86-26011* Arizona State Univ., Tempe.
SUBJECTIVE WORKLOAD AND INDIVIDUAL DIFFERENCES IN INFORMATION PROCESSING ABILITIES
D. L. DAMOS (Arizona State University, Tempe) IN: Aerospace Behavioral Engineering Technology Conference, 3rd, Long Beach, CA, October 15-18, 1984, Proceedings. Warrendale, PA, Society of Automotive Engineers, Inc., 1984, p. 71-74. refs
(Contract NCC2-202)
(SAE PAPER 841491) Copyright

This paper describes several experiments examining the source of individual differences in the experience of mental workload. Three sources of such differences were examined: information processing abilities, timesharing abilities, and personality traits/behavior patterns. On the whole, there was little evidence that individual differences in information processing abilities or timesharing abilities are related to perceived differences in mental workload. However, individuals with strong Type A coronary prone behavior patterns differed in both single- and multiple-task performance from individuals who showed little evidence of such a pattern. Additionally, individuals with a strong Type A pattern showed some dissociation between objective performance and the experience of mental workload. Author

A86-33776
HUMAN FACTORS SOCIETY, ANNUAL MEETING, 29TH, BALTIMORE, MD, SEPTEMBER 29-OCTOBER 3, 1985, PROCEEDINGS. VOLUMES 1 & 2
R. W. SWEZEY, ED. Meeting supported by Carlow Associates, Inc., Army, U.S. Nuclear Regulatory Commission, et al. Santa Monica, CA, Human Factors Society, 1985. Vol. 1, 655 p.; vol. 2, 550 p. For individual items see A86-33777 to A86-33830.
Copyright

Papers are presented on vigilance mechanisms; information-processing approaches to the study of human-computer interaction; human factors in telecommunications; assessing the effects of individual differences on mental and physical workload; computers for training, instruction, and information retrieval; display simplification, visual search, and decluttering; and expert/knowledge-based systems. Topics discussed include vision, information scanning, and retrieval; human factors in accident analysis; managing organizational and product design changes; visual displays and VDT usage; industrial ergonomics; industrial safety; the objectives for human performance and research in military command and control; space and teleoperation; and habitability in constrained/constraining environments. Consideration is given to automation; the use of event-related brain potentials in measurement of attention, performance, and workload; maintenance and simulation training; visual performance and color displays; attention and decision making, human factors in space; and future training technologies. I.F.

A87-12216*# Search Technology, Inc., Norcross, GA.
HUMAN FACTORS OF INTELLIGENT COMPUTER AIDED DISPLAY DESIGN
R. M. HUNT (Search Technology, Inc., Norcross, GA) IN: Annual Aerospace Applications of Artificial Intelligence Conference, 1st, Dayton, OH, September 16-19, 1985, Proceedings. Dayton, OH, AAAIC Secretariat, 1985, p. 173-181. refs
(Contract NAS1-17874)

Design concepts for a decision support system being studied at NASA Langley as an aid to visual display unit (VDU) designers are described. Ideally, human factors should be taken into account by VDU designers. In reality, although the human factors database on VDUs is small, such systems must be constantly developed. Human factors are therefore a secondary consideration. An expert system will thus serve mainly in an advisory capacity. Functions can include facilitating the design process by shortening the time to generate and alter drawings, enhancing the capability of breaking design requirements down into simpler functions, and providing

visual displays equivalent to the final product. The VDU system could also discriminate, and display the difference, between designer decisions and machine inferences. The system could also aid in analyzing the effects of designer choices on future options and in ennunciating when there are data available on a design selections. M.S.K.

A87-16716* George Washington Univ., Washington, DC.
EVALUATION OF EXPERT SYSTEMS - AN APPROACH AND CASE STUDY
J. LIEBOWITZ (George Washington University, Washington, DC) IN: The engineering of knowledge-based systems; Proceedings of the Second Conference on Artificial Intelligence Applications, Miami Beach, FL, December 11-13, 1985. Washington, DC, IEEE Computer Society Press, 1985, p. 564-571. refs
(Contract NGT-09-010-800)
Copyright

Techniques that were applied in defining an expert system prototype for first-cut evaluations of the software functional requirements of NASA satellite command management activities are described. The prototype was developed using the Knowledge Engineering System. Criteria were selected for evaluating the satellite software before defining the expert system prototype. Application of the prototype system is illustrated in terms of the evaluation procedures used with the COBE satellite to be launched in 1988. The limited number of options which can be considered by the program mandates that biases in the system output must be well understood by the users. M.S.K.

A87-16818* Search Technology, Inc., Norcross, GA.
AN ARCHITECTURE FOR INTELLIGENT INTERFACES - OUTLINE OF AN APPROACH TO SUPPORTING OPERATORS OF COMPLEX SYSTEMS
W. B. ROUSE, N. D. GEDDES, and R. E. CURRY (Search Technology, Inc., Norcross, GA) IN: NAECON 1986; Proceedings of the National Aerospace and Electronics Conference, Dayton, OH, May 19-23, 1986. Volume 3. New York, Institute of Electrical and Electronics Engineers, 1986, p. 914-920. refs
(Contract F33615-82-C-0509; NAS1-17874; NAS2-12048)
Copyright

The conceptual design of a comprehensive support system for operators of complex systems is presented. Key functions within the support system architecture include information management, error monitoring, and adaptive aiding. One of the central knowledge bases underlying this functionality is an operator model that involves a 'matrix' of algorithmic and symbolic models for assessing and predicting an operator's activities, awareness resources, intentions, and performance. Functional block diagrams are presented for the overall architecture as well as the key elements within this architecture. A variety of difficult design issues are discussed and ongoing efforts aimed at resolving these issues are noted.
Author

A87-28445* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE DEVELOPMENT OF AN INTELLIGENT USER INTERFACE FOR NASA'S SCIENTIFIC DATABASES
WILLIAM J. CAMPBELL (NASA, Goddard Space Flight Center, Greenbelt, MD) and LARRY H. ROELOFS (Computer Technology Associates, Inc. McLean, VA) Telematics and Informatics (ISSN 0736-5853), vol. 3, no. 3, 1986, p. 177-190. refs
Copyright

The National Space Science Data Center (NSSDC) has initiated an Intelligent Data Management (IDM) research effort which has as one of its components, the development of an Intelligent User Interface (IUI). The intent of the IUI effort is to develop a friendly and intelligent user interface service that is based on expert systems and natural language processing technologies. This paper presents the design concepts, development approach and evaluation of performance of a prototype Intelligent User Interface Subsystem (IUIS) supporting an operational database. Author

A87-33020
MAN/SYSTEM INTEGRATION STANDARDS FOR SPACE SYSTEMS
KEITH H. MILLER (Boeing Aerospace Co., Seattle, WA) IN: Human Factors Society, Annual Meeting, 30th, Dayton, OH, Sept. 29-Oct. 3, 1986, Proceedings. Volume 1. Santa Monica, CA, Human Factors Society, 1986, p. 358-362.
Copyright

This paper presents an overview of the Man/System Integrations Standards (MSIS) program. The standards to be developed by this program provide specific information for use in the design of space systems to ensure proper integration of the man/system interface requirements with those of other aerospace disciplines. These man/system interface requirements apply to the launch, reentry, on-orbit, and extraterrestrial space environments. Concise design considerations, design requirements, and design examples are provided. The standards are being developed with broad government and industry collaboration via a Government/Industry Advisory Group (GIAG) that meets four times with the contractor team to critique the standards as they are being developed. The documentation (released in January 1987) will consist of four hardcopy volumes, a videotape, and a relational database. The videotape uses in-space film footage from Gemini, Skylab, and the Shuttle to illustrate specific man/system integration problems (scenes are cross-referenced to the MSIS topics). The relational database provides a means for storing and manipulating the MSIS data. Author

A87-33044
EFFECTS OF DISPLAY PROXIMITY AND MEMORY DEMANDS ON THE UNDERSTANDING OF DYNAMIC MULTIDIMENSIONAL INFORMATION
KELLY HARWOOD, CHRISTOPHER WICKENS, ARTHUR KRAMER, DEANNA CLAY, and YILI LIU (Illinois, University, Champaign) IN: Human Factors Society, Annual Meeting, 30th, Dayton, OH, Sept. 29-Oct. 3, 1986, Proceedings. Volume 2. Santa Monica, CA, Human Factors Society, 1986, p. 786-789. refs
(Contract F30602-81-C-0206)
Copyright

Two experiments explored the ability of individuals to integrate several sources of information about units or conceptual objects. The task domain might describe the air traffic controller's monitoring of the horizontal and vertical separation of several aircraft, the process controller's supervision of the temperature, pressure, and entropy of several energy systems, or any other multidimensional database. The first experiment examined working memory limits for different object-attribute combinations. When subjects monitored a display with a smaller number of objects with more attributes, responses were slower but significantly more accurate than for a larger number of objects with few attributes. In the second experiment, interest centered on how variations of proximity affect the detection of events that occur within a multidimensional database. Results showed that the use of color and spatial position to define proximity facilitated information integration and thereby event detection. Author

A87-33502
STRATEGY AND OPTIMIZATION IN HUMAN INFORMATION PROCESSING
GEORGE SPERLING (New York University, NY) and BARBARA ANNE DOSHER (Columbia University, New York) IN: Handbook of perception and human performance. Volume 1. New York, Wiley-Interscience, 1986, p. 2-1 to 2-65. refs
Copyright

Methods and theories for studying a subject's strategies in the performance of perceptual and cognitive tasks are discussed. Compound and concurrent tasks are defined and compared. The signal detection theory, attention, and economics are examined. Resource sharing and concurrent tasks, in particular simultaneous auditory two-channel detection, shadowing, concurrent visual search, and attention operating characteristics, are analyzed. Consideration is given to ideal performance in compound reaction-time tasks, the costs and benefits in reaction time tasks,

and speed-accuracy trade-offs. Pure strategy, resource allocation, and strategy mixtures are described. Path dependence in performance operating characteristics and the dynamics of strategy switching are investigated. Examples of compound and concurrent tasks are presented. I.F.

A87-33532
THE MODEL HUMAN PROCESSOR - AN ENGINEERING MODEL OF HUMAN PERFORMANCE
STUART K. CARD, THOMAS P. MORAN (Xerox Research Center, Palo Alto, CA), and ALLEN NEWELL (Carnegie-Mellon University, Pittsburgh, PA) IN: Handbook of perception and human performance. Volume 2. New York, Wiley-Interscience, 1986, p. 45-1 to 45-35. refs
Copyright

A human processor model of the human mind is proposed. The model is composed of a set of memories and processors combined with a set of operating principles, and it represents three interacting subsystems. The functions of the perceptual, motor, and cognitive systems are described. Consideration is given to the performance of tasks such a perception, motor skill, simple decision, learnig and retrieval, and problem solving; examples of these tasks are presented. The limitations of the human processor model are discussed. I.F.

A87-48582*# National Aeronautics and Space Administration, Washington, DC.
SCIENTIFIC CUSTOMER NEEDS - NASA USER
DAVID C. BLACK (NASA, Washington, DC) AIAA and NASA, International Symposium on Space Information Systems in the Space Station Era, Washington, DC, June 22, 23, 1987. 4 p.
(AIAA PAPER 87-2196) Copyright

Some requirements for scientific users of the Space Station are considered. The use of testbeds to evaluate design concepts for information systems, and for interfacing between designers and builders of systems is examined. The need for an information system that provides an effective interaction between ground-based users and their space-based equipment is discussed. I.F.

A88-16167#
NASA-STD-3000, MAN-SYSTEM INTEGRATION STANDARDS - THE NEW SPACE HUMAN ENGINEERING STANDARDS
KEITH H. MILLER and CHARLES W. GEER (Boeing Aerospace Co., Seattle, WA) IAF, International Astronautical Congress, 38th, Brighton, England, Oct. 10-17, 1987. 8 p.
(IAF PAPER 87-550) Copyright

Various aspects of the process used to develop NASA-STD-3000, Man-System Integration Standards (MSIS) are reviewed, as are the documents, the database, and a videotape that are currently available from NASA. The MSIS provides the specific information needed to ensure proper integration of the man-system interface requirements with those of other aerospace disciplines. In addition to the requirements, the MSIS provides design considerations and examples which help the user understand the rationale behind the requirements. The implementation and maintenance of MSIS are also discussed. V.L.

A88-35376
ADVANCED HELICOPTER COCKPIT INFORMATION MANAGEMENT
STEVE MARTZ (Boeing Military Airplane Co., Wichita, KS), CATHY LEININGER, and JIM DACUS (Boeing Computer Services Co., Wichita, KS) IN: Rotorcraft flight controls and avionics; Proceedings of the National Specialists' Meeting, Cherry Hill, NJ, Oct. 13-15, 1987. Alexandria, VA, American Helicopter Society, 1987, 8 p. refs
Copyright

The growing complexity of advanced helicopter systems has increased pilot workload. Human-machine interface characteristics and thus mission performance are adversely affected by less than optimal integration of information from complex helicopter systems. Expert system technology offers great potential for alleviating the pilot workload associatd with making routine as well as exceptional decisions as to information to be displayed. The numerous possible combinations of display information can be intelligently filtered by an expert system dedicated to cockpit information management. An additional benefit is the flexibility obtained through an expert system implementation of a cockpit information manager. This paper describes a prototype expert system developed to demonstrate these benefits. Author

A88-35401
HUMAN FACTORS SOCIETY, ANNUAL MEETING, 31ST, NEW YORK, NY, OCT. 19-23, 1987, PROCEEDINGS. VOLUMES 1 & 2
Meeting organized by the Human Factors Society; Sponsored by the American Telephone and Telegraph Co., Bell Communications Research, Inc., IBM, et al. Santa Monica, CA, Human Factors Society, 1987, p. Vol. 1, 753 p.; vol. 2, 728 p. For individual items see A88-35402 to A88-35498.
Copyright

Topics discussed include macroergonomics, automation safety, general techniques of test and evaluation, issues in training design, performance issues in displays and control, biomechanical methods, the criterion task set, simulator sickness, capacity limitations in human information processing, and the use of physiological measures in aviation-related research. Attention is also given to ergonomic design, hands and gloves, database access and format, envrironmental design, visual and auditory detection performance, development of test methods, and tools and techniques for interface design. B.J.

A88-35404
EMPIRICAL USER MODELING - COMMAND USAGE ANALYSES FOR DERIVING MODELS OF USERS
MATTHEW P. ANDERSON, JAMES E. MCDONALD, and ROGER W. SCHVANEVELDT (New Mexico State University, Las Cruces) IN: Human Factors Society, Annual Meeting, 31st, New York, NY, Oct. 19-23, 1987, Proceedings. Volume 1. Santa Monica, CA, Human Factors Society, 1987, p. 41-45. refs
Copyright

Models of users' procedural knowledge were derived from the records of command usage obtained from nine experienced users of the Unix operating system. Pairwise transitions between user command entries were analyzed for the purpose of identifying salient command patterns associated with task-based user behaviors. Structural models of command usage patterns were obtained from Pathfinder network scaling of Unix command events. The network representation of command patterns was evaluated as a method for abstracting users' procedural knowledge. These network scaling solutions revealed patterns that were common both within and across users' command usage. Author

A88-35418
ADVANCED HUMAN FACTORS ENGINEERING TOOL TECHNOLOGIES
KATHRYN E. PERMENTER, STEPHEN A. FLEGER, and THOMAS B. MALONE (Carlow Associates, Inc., Fairfax, VA) IN: Human Factors Society, Annual Meeting, 31st, New York, NY, Oct. 19-23, 1987, Proceedings. Volume 1. Santa Monica, CA, Human Factors Society, 1987, p. 345-349.
Copyright

The paper presents results of a study to identify advanced human factors engineering (HFE) tool technologies that are in use, or projected for use, by HFE practitioners. The study was intended to suport the U.S. Army's MANPRINT program. Practitioners reported that the greatest need within the HF community was for the development of automated task analysis programs, HF database compendia, workload prediction tools, and expert systems. The majority of practitioners surveyed expressed a desire to see more advanced tools developed for the microcomputer. B.J.

A88-46511* Miami Univ., Coral Gables, FL.
FALLIBLE HUMANS AND VULNERABLE SYSTEMS - LESSONS LEARNED FROM AVIATION
EARL L. WIENER (Miami, University, Coral Gables, FL) IN: Information systems: Failure analysis; Proceedings of the NATO Advanced Research Workshop, Bad Windsheim, Federal Republic of Germany, Aug. 18-22, 1986. Berlin and New York, Springer-Verlag, 1987, p. 163-181. refs
(Contract NCC2-377)
Copyright

It is suggested that the problems being experienced in complex automatic systems are essentially due to the failure of information management and communication. The failure covers the entire spectrum: display devices and techniques, coding information so as to reduce human error, and information economy, i.e., resisting the temptation to bombard the operator with unlimited information simply because the system possesses the capability to do so. Since there has been great progress in hardware engineering, it is suggested that further attention is needed in the 'soft' side of systems. The approach should focus on (1) preventing human cognitive slips and (2) making the systems less vulnerable to such slips when they do occur. Most of the examples are taken from studies of cockpit automation. B.J.

A89-12179
AN AIDE FOR INSTRUCTION ON INTEGRATED ENGINEERING DESIGN AND SUPPORT
B. K. HATCHELL, G. BENATAR, R. E. FULTON (Georgia Institute of Technology, Atlanta), and C. L. BLACKBURN (PRC Kentron, Inc., Hampton, VA) Engineering with Computers (ISSN 0177-0667), vol. 4, no. 1-2, 1988, p. 39-52. Research supported by the Georgia Institute of Technology. refs
(Contract F33615-84-C-3216)
Copyright

The development and use of an interpreted design support-prototype instructor (IDS/PI) system to serve as an education and research guide for integration and data base management concepts are reported. The key software includes a computer-aided design system, a structural analysis program, various graphics packages, and a relational data base management system. The principal features of the IDS/PI system are described, and its usefulness is illustrated by examples. V.L.

A89-18865
HUMAN FACTORS IMPACT ON THE V-22 OSPREY COCKPIT DEVELOPMENT - AN OVERVIEW
VIRGIL A. GRAF and CHARLES D. HOLLEY (Bell Helicopter Textron, Inc., Fort Worth, TX) IN: AHS, Annual Forum, 44th, Washington, DC, June 16-18, 1988, Proceedings. Alexandria, VA, American Helicopter Society, 1988, p. 201-212. refs
Copyright

The V-22 is a multimission, multiservice tiltrotor aircraft that will make its first flight this year. The crewstation configuration, with its advanced cockpit management system, represents the culmination of the human engineering (HE) program from predesign through full-scale development. To illustrate the HE impact on the development program, three representative cockpit domains are described: control and display architecture, display design, and cockpit visibility. The HE process, including associated tools, is emphasized throughout the discussion. Implementation of this process has resulted in a cockpit that is designed with the user as a prime consideration. Author

A89-29067* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE TRANSPORTABLE APPLICATIONS ENVIRONMENT - AN INTERACTIVE DESIGN-TO-PRODUCTION DEVELOPMENT SYSTEM
DOROTHY C. PERKINS, DAVID R. HOWELL, and MARTHA R. SZCZUR (NASA, Goddard Space Flight Center, Greenbelt, MD) IN: Digital image processing in remote sensing. London and Philadelphia, PA, Taylor and Francis, 1988, p. 39-64. refs
Copyright

An account is given of the design philosophy and architecture of the Transportable Applications Environment (TAE), an executive program binding a system of applications programs into a single, easily operable whole. TAE simplifies the job of a system developer by furnishing a stable framework for system-building; it also integrates system activities, and cooperates with the host operating system in order to perform such functions as task-scheduling and I/O. The initial TAE human/computer interface supported command and menu interfaces, data displays, parameter-prompting, error-reporting, and online help. Recent extensions support graphics workstations with a window-based, modeless user interface. O.C.

A89-45294#
A PILOT'S VIEW OF INTELLIGENT SYSTEMS
DOUGLAS M. HOSMER (Lockheed Aeronautical Systems Co., Burbank, CA) Aerospace America (ISSN 0740-722X), vol. 27, July 1989, p. 32, 33.
Copyright

The current trend toward single-seat combat aircraft and the accompanying evolution of avionics and complex subsystems have increased pilot workloads to a degree that is unacceptable in combat. An interactive/cooperative real-time expert system functioning as 'pilot's associate' is therefore proposed which can alternatively either assess a situation and advise the pilot as to possible courses of action or, in the event of the pilot's delegation of the requisite authority, take appropriate action. The greatest anticipated payoff from a pilot's associate system lies in the sorting, filtering, and fusing of information destined for the pilot's attention and decisionmaking. O.C.

A89-49456#
COCKPIT INFORMATION MANAGEMENT THROUGH AN INTELLIGENT PILOT/VEHICLE INTERFACE
RALPH E. LAMBERT (McDonnell Aircraft Co., Saint Louis, MO) AIAA, AHS, and ASEE, Aircraft Design, Systems and Operations Conference, Seattle, WA, July 31-Aug. 2, 1989. 10 p.
(AIAA PAPER 89-2098) Copyright

The development of a cockpit information management system that can integrate data into useable information for the pilot is discussed, focusing on the pilot/vehicle interface (PVI). The ways in which a PVI would transmit information to the pilot of a fighter and attack aircraft are examined for various events, including encounter with enemy aircraft, alternate target decision, fuel problems, and recovery. R.B.

N84-14795# Los Alamos Scientific Lab., NM. Computer User Services Group.
MODELING THE USER IN INTELLIGENT USER INTERFACES
M. L. STODDARD and R. J. DOUGLASS 1983 9 p refs
Presented at the CHI Conf., Cambridge, Mass. 12-15 Dec. 1983
(Contract W-7405-ENG-36)
(DE84-012664; LA-UR-83-1392; CONF-831202-2) Avail: NTIS HC A02/MF A01

A methodology for explicitly defining a model of a program's users and for evaluating the effectiveness of the user interface is presented. The development of an explicit user model will reduce user costs by both reducing the cost of software development and increasing user productivity. The components of the methodology are described, and an example of using the methodology in the development of an expert consultant system is given. The methodology is useful in preliminary design and testing of such interactive software as electronic mail, information retrieval systems, editors, and management information systems. DOE

N84-15790# Hawaii Univ., Manoa.
INFLUENCES ON GROUP PRODUCTIVITY. 2: FACTORS INHERENT IN THE PERSON. A BIBLIOGRAPHIC SYNOPSIS Interim Report
S. OSATO, P. E. CAMPOS, N. GOODMAN (St. Peters College), and D. LANDIS (Indiana Univ. - Purdue Univ.) 15 Jul. 1983 62 p refs

(Contract N00014-83-K-0021)
(AD-A131015; CARE-83-3) Avail: NTIS HC A04/MF A01 CSCL 05/10

The present summary examines the effects of heterogeneity on a group's productivity. Heterogeneity has been defined on many different dimensions without much consistency between workers. For the sake of clarity, we have grouped the studies by the type of variable used to define heterogeneity: personality variables or sociodemographic variables. In all the studies surveyed, these different variables have served as the independent dimension. GRA

N84-18113# Rutgers - The State Univ., New Brunswick, NJ.
SERVICES FOR THE ANALYSIS AND EVALUATION OF INFORMATION Final Report
H. J. HALL 22 Dec. 1982 127 p
(Contract NSF-67015628)
(PB84-104504) Avail: NTIS HC A07/MF A01 CSCL 05/2

Skilled services for the analysis and evaluation of information (IAE) go beyond searching and retrieval to provide information that is critically evaluated for use. This is a study of what IAE is and does, based on field interviews and extensive seminar discussions with information managers, analysts, and major users. The IAE is a form of team research that depends on one-to-one interactions between the information customer, the research user, and an experienced professional analyst. GRA

N84-20187# Navy Personnel Research and Development Center, San Diego, CA.
GUIDE TO THE DEVELOPMENT OF A HUMAN FACTORS ENGINEERING DATA RETRIEVAL SYSTEM Interim Report, 1 Oct. 1981 - 30 Sep. 1982
D. MEISTER and R. E. BLANCHARD Nov. 1983 44 p
(Contract F57-526)
(AD-A136918; NPRDC-TR-84-4) Avail: NTIS HC A03/MF A01 CSCL 05/5

This report describes the functional specifications for the development of a human factors engineering (HFE) data retrieval system to be used by system acquisition managers, designers, and HFE specialists. The system is organized around the following requirements: system must be responsive to the needs of a variety of users, include data of the type presently available in MIL STD 1472C plus quantitative estimates of human performance, maintenance and logistics data, specifications and standards, and analytical and evaluational techniques, include data from operational Navy sources not presently found in any HFE data base, be formatted in three tracks, with Track 1 consisting of abstracts of individual studies, Track 2 containing data from the same sources but in a highly synthesized form, and Track 3 containing all other ancillary information such as HFE specifications and standards. GRA

N84-22254# Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Engineering.
A NATURAL LANGUAGE INTERFACE FOR A PROLOG DATABASE M.S. Thesis
R. P. WHITE 16 Dec. 1983 85 p
(AD-A138071; AFIT/GCS/EE/83D-22) Avail: NTIS HC A05/MF A01 CSCL 09/2

A natural language (NL) interface to a relational data base was developed with careful consideration given to the human factors needed to aid a novice user in accessing data. The entire system is written in DEC-10 PROLOG, with three distinguishing contributions: A simple grammar was developed to parse phrases like: 'officers where rank is captain and status is single and age is less than 32'; the developed NL compiler accepts English phrases or commands as queries and translates them into PROLOG; The human factors that contribute to the system are: a help file to aid user perception of the data, a simple grammar, an interactive view of all retrieved tuples, two forms of ellipsis, user defined aliases, and limited use of quantifiers. GRA

N84-22844# Massachusetts Inst. of Tech., Cambridge.
INFORMATION THEORETIC MODELS OF MEMORY IN HUMAN DECISIONMAKING MODELS
S. A. HALL and A. H. LEVIS *In its* Proc. of the 6th MIT/ONR Workshop on C3 (Command, Control, and Commun.) Systems p 67-75 Dec. 1983 Prepared in cooperation with RCA Astro-Electronics Div., Princeton, N.J.
(Contract AF-AFOSR-0029-80)
(AD-P002883) Avail: NTIS HC A14/MF A02 CSCL 12/1

Models of memory and information storage useful in the modeling and analysis of decisionmaking with bounded rationality are discussed. An information theoretic model of permanent memory is presented for describing the accessing of stored information by the algorithms within the human decisionmaker model. It is then applied to the study of the performance - workload characteristic of a decisionmaker performing a dual task. Author (GRA)

N84-28452# Air Force Academy, CO.
MANAGEMENT INFORMATION SYSTEMS: A NEED FOR HUMAN FACTORS
J. A. BOYLESS *In its* Proc. of the 9th Symp. on Psychol. in the DOD p 385-389 Apr. 1984
(AD-P003313) Avail: NTIS HC A99/MF E06 CSCL 05/1

The microcomputer revolution in management information systems now allows almost instant access to millions of bits of information to predict, trend, or even recall past activities. Additionally, the access to this information is now being accomplished by placing the computer on desktops everywhere. Often these computers are user friendly and little or no computerese is needed to operate them. These desktop computers have been human engineered from the software point of view but often the actual human engineering development and evaluation is lacking. This paper takes a general look at the lack of human engineering development and evaluation and suggests items that should be addressed in these two areas. Author (GRA)

N84-29481# Naval Training Equipment Center, Orlando, FL.
ANNOTATED BIBLIOGRAPHY OF HUMAN FACTORS LABORATORY REPORTS (1945-1968): SUPPLEMENT 4, 1979-1983
Jan. 1984 36 p
(AD-A142141; NAVTRAEQUIPC-IH-158) Avail: NTIS HC A03/MF A01 CSCL 05/5

A complete bibliographic reference and an abstract are given for each publication of the Human Factors Laboratory from 1979 through 1983 including in-house and contractor-developed documents. Three indexes are provided: Index by Source, Author Index, and Subject Matter Index. GRA

N84-32275 Stanford Univ., CA.
THE USER'S MENTAL MODEL OF AN INFORMATION RETRIEVAL SYSTEM: EFFECTS ON PERFORMANCE Ph.D. Thesis
C. L. BORGMAN 1984 377 p
Avail: Univ. Microfilms Order No. DA8408258

An empirical study was performed to train naive subjects in the use of a prototype Boolean logic-based information retrieval system on a database of bibliographic records drawn from the OCLC system. The research was based on the mental models theory from cognitive psychology which proposes that people can be trained to develop a mental model or a qualitative simulation of a system which will aid in generating methods for interacting with the system, debugging errors, and keeping track of one's place in the system. Conceptual training based on a system model will be superior to procedural training in the mechanics of the system. A laboratory experiment was performed with two training conditions (conceptual and procedural), with each condition split by gender. As predicted, the conceptual training had no effect on the ability to perform simple, procedural tasks, but subjects trained conceptually performed better on complex tasks which require extrapolation from the basic operations of the system. The few gender differences that were found were trivial. Dissert. Abstr.

N85-19647# Computer Technology Associates, Inc., Englewood, CO.
SECTOR SUITE MAN-MACHINE FUNCTIONAL CAPABILITIES AND PERFORMANCE REQUIREMENTS Final Report
H. A. AMMERMAN, ARDREY, BERGEN, BRUCE, FLIGG, JONES, G. V. KLOSTER, LENOROVITZ, PHILLIPS, and REEVES 10 Aug. 1984 410 p
(Contract DT-FA01-83-Y-10554)
(AD-A148881; FAA-APO-84-18; FR-4) Avail: NTIS HC A18/MF A03 CSCL 05/8

Sector Suite Man/Machine Functional Capabilities and Performance Requirements documents both the Sector Suite (SS) Man/Machine Interface (MMI) Functional Capabilities and the SS Workstation Functional Capabilities. Requirement specifications are defined for SS MMI application processes, user interface language, display management, resource management, error detection/recovery, data base update/retrieval and SS workstation hardware. The controller tasks defined in CDRL A002-Operations Concept for the AAS MMI are further decomposed into task elements which address data inputs and outputs, and task criticality and frequency. These task element statements are then used to derive SS functional requirements. This analysis provides the basis for a conceptual model of interaction, derives the functional capabilities and performance requirements for essential SS hardware and software functions, drives MMI processing capacity and response time requirements, and defines the requirements for MMI data bases and data base management. GRA

N85-19649# Human Engineering Labs., Aberdeen Proving Ground, MD.
GUIDE TO HUMAN FACTORS INFORMATION SOURCES Final Report
T. J. WANG Nov. 1984 42 p Sponsored by Army
(AD-A149102) Avail: NTIS HC A03/MF A01 CSCL 05/5

This guide shows how to search for literature relating to human factors. Manual and machine procedures are discussed in detail. Attention is directed to the development and location of sources of human factors expository material and human factors quantitative data. GRA

N86-18985# Carnegie-Mellon Univ., Pittsburgh, PA. Dept. of Psychology.
BEYOND ASSOCIATIONS: STRATEGIC COMPONENTS IN MEMORY RETRIEVAL Technical Report, Jun. 1983 - Jul. 1985
L. M. REDER 3 Oct. 1985 44 p
(Contract N00014-84-K-0063; NSF BNS-03711; RR0-4206)
(AD-A160783; TR-85-3-ONR) Avail: NTIS HC A03/MF A01 CSCL 05/10

There are two dominant approaches to understanding human memory, one in the tradition of Ebbinghaus, the other in the tradition of Bartlett. The former approach views learning as the formation of associations, while in the latter views memory as the process of reconstruction of fragments based on prior knowledge. These positions are often considered antithetical: Ebbinghaus was concerned with laws of memory and tried to control for prior knowledge; Bartlett was concerned with how our world knowledge interacts with learning and memory. This paper argues that one can collect data that supports either position because people can adopt one of several memory strategies. Data are reviewed that illustrate that the same knowledge structure can produce dramatically different results, depending on the strategies that operate on that structure. Author (GRA)

N86-21143# California Univ., San Diego. Jolla.
INTERACTIVE ACTIVATION MODELS OF PERCEPTION AND COMPREHENSION Status Report, 1 Dec. 1984 - 1 Oct. 1985
J. L. ELMAN and J. L. MCCLELLAND 1 Oct. 1985 15 p
(Contract N00014-85-K-0076)
(AD-A161362) Avail: NTIS HC A03/MF A01 CSCL 05/10

The objective of this research is to construct a computationally sufficient, biologically plausible, and behaviorally adequate account of human information processing skills in visual and auditory language processing. We have the following specific research goals for our contract: (1) To implement a model of reading printed text through a series of fixations. The model is intended to account for the integration of visual information over successive fixations, and the interaction of visual and contextual information in reading. (2) To implement a new version of our model of speech perception (TRACE), using programmable connections to allow the model to tune itself, in the course of processing, to changes in global parameters such as rate. This new model (which we will call the Programmable TRACE) is intended to account for human sensitivity to global as well as local contextual influences on the speech signal while retaining all the virtures of the present version of TRACE. (3) To begin work on the development of simulation models designed to capture aspects of interactions between lexical, syntactic, and semantic constraints on the construction of syntactic and functional representations of sentences. GRA

N86-25123# Naval Postgraduate School, Monterey, CA.
MAN-MACHINE SYSTEMS OF THE 1990 DECADE: COGNITIVE FACTORS AND HUMAN INTERFACE ISSUES
P. J. HOFFMAN Aug. 1985 53 p refs
(AD-A163865; NPS74-85-002) Avail: NTIS HC A04/MF A01 CSCL 05/8

This paper presents the primary psychological concepts which are fundamental to the design of man-machine interfaces for intelligent systems of the 1990's. These concepts embrace perception, learning motivation, and cognitive capacities of human operators, in systems which require a high degree of operator-machine interaction. The central role of feedback is emphasized through simple schematic examples, designed to provide an understanding of the reciprocity requirements in man-machine communication. Cognitive theory and recent experimental data form the basis for discussion of visual image storage, short-term memory, long-term memory, transfer rates and buffering of information being processed by the human operator, under control of a central processor with a cycle time of roughly 70 milliseconds. Systems of the 1990 era will provide increased capability for high-speed processing of data and will utilize increasing numbers of decision-aides, spreadsheets and AI tools. Users of these systems will be components of networks, linked via efficient communication systems to other users and other subsystems. These developments will lead to fundamental changes in the work place. GRA

N86-32983*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
MEMORY AND SUBJECTIVE WORKLOAD ASSESSMENT
L. STAVELAND (San Jose State Univ., Calif.), S. HART, and Y. Y. YEH (Illinois Univ., Urbana-Champaign.) *In its* 21st Annual Conference on Manual Control 13 p May 1986
Avail: NTIS HC A22/MF A03 CSCL 05/8

Recent research suggested subjective introspection of workload is not based upon specific retrieval of information from long term memory, and only reflects the average workload that is imposed upon the human operator by a particular task. These findings are based upon global ratings of workload for the overall task, suggesting that subjective ratings are limited in ability to retrieve specific details of a task from long term memory. To clarify the limits memory imposes on subjective workload assessment, the difficulty of task segments was varied and the workload of specified segments was retrospectively rated. The ratings were retrospectively collected on the manipulations of three levels of segment difficulty. Subjects were assigned to one of two memory groups. In the Before group, subjects knew before performing a block of trials which segment to rate. In the After group, subjects did not know which segment to rate until after performing the block of trials. The subjective ratings, RTs (reaction times) and MTs (movement times) were compared within group, and between group differences. Performance measures and subjective evaluations of workload reflected the experimental manipulations. Subjects were sensitive to different difficulty levels, and recalled the average workload of task components. Cueing did not appear to help recall, and memory group differences possibly reflected

variations in the groups of subjects, or an additional memory task. Author

N86-32985*# California Univ., Los Angeles. Dept. of Safety Science and Human Factors.
KNOWLEDGE-BASED LOAD LEVELING AND TASK ALLOCATION IN HUMAN-MACHINE SYSTEMS
M. H. CHIGNELL and P. A. HANCOCK *In* NASA. Ames Research Center, 21st Annual Conference on Manual Control 11 p May 1986
Avail: NTIS HC A22/MF A03 CSCL 05/8

Conventional human-machine systems use task allocation policies which are based on the premise of a flexible human operator. This individual is most often required to compensate for and augment the capabilities of the machine. The development of artificial intelligence and improved technologies have allowed for a wider range of task allocation strategies. In response to these issues a Knowledge Based Adaptive Mechanism (KBAM) is proposed for assigning tasks to human and machine in real time, using a load leveling policy. This mechanism employs an online workload assessment and compensation system which is responsive to variations in load through an intelligent interface. This interface consists of a loading strategy reasoner which has access to information about the current status of the human-machine system as well as a database of admissible human/machine loading strategies. Difficulties standing in the way of successful implementation of the load leveling strategy are examined. Author

N87-13840# Naval Postgraduate School, Monterey, CA.
USER INTERFACE DESIGN FOR TWO DIMENSIONAL POLYGONALLY ENCODED GEOLOGICAL SURVEY MAPS
J. M. AMMANN, R. B. MCGHEE, and M. J. ZYDA Jul. 1986 80 p
(AD-A170612; NPS52-86-017) Avail: NTIS HC A05/MF A01 CSCL 08/2

This study presents an overview of a cartographic processing pipeline for the generation and maintenance of polygonally encoded data bases from published U.S. Geological Survey maps. The focus of this research centers on the development of an interactive editing system. The editor, serving as the final step in the overall project, provides the user with the capability to correct and modify dated topographic characteristics. A variety of processing and digitizer induced errors introduced into the data base from previous utility steps can also be corrected. Included is a discussion on the internal indexing scheme used for managing revisions and the techniques and algorithms for updating the data bases. GRA

N87-16657# Defense Technical Information Center, Alexandria, VA. Office of Information Systems and Technology.
PROCEEDINGS OF THE 2ND CONFERENCE ON COMPUTER INTERFACES AND INTERMEDIARIES FOR INFORMATION RETRIEVAL Summary Report
CAROL E. JACOBSON and SHIRLEY A. WITGES May 1986 379 p Proceedings held in Boston, Mass., 28-31 May 1986; sponsored in part by MIT
(AD-A174000; DTIC/TR-86/5) Avail: NTIS HC A17/MF A02 CSCL 05/2

These proceedings consist of papers and product descriptions presented at the conference which was jointly sponsored by the Defense Technical Information Center and the Massachusetts Institute of Technology. The purpose of this conference was to bring together experts in the field of user interfaces and gateways for information retrieval systems. Twenty eight speakers presented papers in the following areas of interest: artificial intelligence in retrieval, gateways, interfaces, common command language, and natural language. GRA

N87-22410*# National Aeronautics and Space Administration, Washington, DC.
NASA INFORMATION SCIENCES AND HUMAN FACTORS PROGRAM Annual Report, 1984
LEE B. HOLCOMB, DUNCAN E. MCIVER, JOHN D. DIBATTISTA, RONALD L. LARSEN, MELVIN D. MONTEMERLO, KEN WALLGREN, MARTY SOKOLOSKI, and DICK WASICKO May 1985 190 p
(NASA-TM-87569; NAS 1.15:87569) Avail: NTIS HC A09/MF A01 CSCL 05/8

This report contains FY 1984/85 descriptions and accomplishments in six sections: Computer Science and Automation, Controls and Guidance, Data Systems, Human Factors, Sensor Technology, and Communications. Author

N87-23158*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
THE EVALUATION AND EXTENSION OF TAE IN THE DEVELOPMENT OF A USER INTERFACE MANAGEMENT SYSTEM
BRENDA BURKHART and ROSS SUGAR (Century Computing, Inc., Laurel, Md.) *In* NASA. Goddard Space Flight Center Sixth Annual Users' Conference p 31-37 Oct. 1986
Avail: NTIS HC A11/MF A02 CSCL 09/2

The development of a user interface management system (UIMS) for an information gathering and display system is discussed. The system interface requirements are outlined along with the UIMS functional characteristics. Those systems requirements which are supported by the current Transportable Applications Executive (TAE) are listed and necessary modifications to the TAE are described. M.G.

N87-24098*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE DEVELOPMENT OF A PROTOTYPE INTELLIGENT USER INTERFACE SUBSYSTEM FOR NASA'S SCIENTIFIC DATABASE SYSTEMS
WILLIAM J. CAMPBELL, LARRY H. ROELOFS, and NICHOLAS M. SHORT, JR. (Science Applications Research, Lanham, Md.) Jun. 1987 57 p
(NASA-TM-87821; REPT-87-B-0266; NAS 1.15:87821) Avail: NTIS HC A04/MF A01 CSCL 09/2

The National Space Science Data Center (NSSDC) has initiated an Intelligent Data Management (IDM) research effort which has as one of its components the development of an Intelligent User Interface (IUI).The intent of the latter is to develop a friendly and intelligent user interface service that is based on expert systems and natural language processing technologies. The purpose is to support the large number of potential scientific and engineering users presently having need of space and land related research and technical data but who have little or no experience in query languages or understanding of the information content or architecture of the databases involved. This technical memorandum presents prototype Intelligent User Interface Subsystem (IUIS) using the Crustal Dynamics Project Database as a test bed for the implementation of the CRUDDES (Crustal Dynamics Expert System). The knowledge base has more than 200 rules and represents a single application view and the architectural view. Operational performance using CRUDDES has allowed nondatabase users to obtain useful information from the database previously accessible only to an expert database user or the database designer. Author

N87-29132*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
INTELLIGENT DATA MANAGEMENT
WILLIAM J. CAMPBELL *In* NASA, Washington, Proceedings: Computer Science and Data Systems Technical Symposium, Volume 1 18 p Aug. 1985
Avail: NTIS HC A16/MF A02 CSCL 09/2

Intelligent data management is the concept of interfacing a user to a database management system with a value added service that will allow a full range of data management operations at a high level of abstraction using human written language. The development of such a system will be based on expert systems and related artificial intelligence technologies, and will allow the capturing of procedural and relational knowledge about data management operations and the support of a user with such

knowledge in an on-line, interactive manner. Such a system will have the following capabilities: (1) the ability to construct a model of the users view of the database, based on the query syntax; (2) the ability to transform English queries and commands into database instructions and processes; (3) the ability to use heuristic knowledge to rapidly prune the data space in search processes; and (4) the ability to use an on-line explanation system to allow the user to understand what the system is doing and why it is doing it. Additional information is given in outline form. Author

N88-18189# Naval Personnel Research and Development Center, San Diego, CA.
METHODS OF ELICITING INFORMATION FROM EXPERTS
DAVID MEISTER Oct. 1987 27 p
(AD-A187468; NPRDC-TN-88-2) Avail: NTIS HC A03/MF A01 CSCL 05/8

The biggest bottleneck in the development of expert systems is the problem of eliciting from experts the mechanisms responsible for their expertise. This report examines what is known about experts and suggests a number of ways of eliciting information from them. The literature suggests that the mechanisms of expertise represent deep-seated ways of conceptualizing and perceiving stimuli, and that these mechanisms must be differentiated from relatively superficial proceduralized rules, which make up most of what expert information consists of today. The goal of reproducing the expert's mental processes in a computer system appears unrealistic at present. The only way of determining that one has, in fact, tapped expertise is to build the expert system and evaluate its effectiveness. If it matches or surpasses human proficiency, one has incorporated human expertise into the system. GRA

N88-18298# North Carolina Univ., Chapel Hill. Dept. of Computer Science.
A HYPERTEXT WRITING ENVIRONMENT AND ITS COGNITIVE BASIS
JOHN B. SMITH, STEPHEN F. WEISS, and GORDON J. FERGUSON Oct. 1987 22 p
(Contract MDA903-86-C-0345)
(AD-A188179; TR-87-033) Avail: NTIS HC A03/MF A01 CSCL 05/8

Writing Environment (WE) is a hypertext writing environment that can be used to create both electronic and printed documents. It is intended for professionals who work within a computer network of professional workstations. Since writing is a complex mental activity that uses many different kinds of thinking, WE was designed in accord with an explicit cognitive model for writing. That model raises several important questions for both electronic and printed documents. The paper includes a discussion of the underlying cognitive model, a description of WE as it currently exists and as it will be extended in the near future, as well as a brief outline of experiments being conducted to evaluate both model and system. It concludes by re-examining some of the issues raised by the cognitive model in light of WE, especially the role of constraints in hypertext systems. GRA

N88-20825# Carlow Associates, Inc., Fairfax, VA.
ADVANCED HUMAN FACTORS ENGINEERING TOOL TECHNOLOGIES Final Report, 18 Jul. 1986 - 2 Apr. 1987
STEPHEN A. FLEGER, KATHRYN E. PERMENTER, and THOMAS B. MALONE 20 Mar. 1987 276 p
(Contract DAAA15-86-C-0064)
(AD-A189390) Avail: NTIS HC A13/MF A02 CSCL 23/2

Presented are the results of a study to identify the human factors engineering (HFE) technologies or tools presently used, and projected for use, by HFE specialists. Both traditional and advanced tools were candidates for inclusion in the report, although the emphasis of the study was on advanced computer applications. Human factors practitioners representing the government, the military, academe and private industry were surveyed to identify those tools most frequently used or viewed as most important for conducting human factors engineering related work. If advanced tool capabilities did not meet existing job requirements, the specialists identified the types of tools they would like to see developed to fill the existing technology gaps. The advanced tools were categorized using an eight point classification scheme, which included the phase(s) of the material acquisition process in which the tools' application would be most appropriate. All of the tools were ranked to facilitate tool selection, and entered into a database to accommodate future revisions. The survey resulted in the identification of 113 advanced human factors engineering tools. GRA

N88-26114# Oak Ridge National Lab., TN.
COMPUTER-AIDED RESEARCH
D. S. HARTLEY, III Mar. 1988 27 p
(Contract DE-AC05-84OR-21400)
(DE88-007771; ORNL/DSRD/TM-11) Avail: NTIS HC A03/MF A01

A computer system can be an invaluable aid to the author of a professional article by helping him to gather, maintain and use reference notes made during the literature-search phase. The researcher/author can build his own set of cross references as he goes and then retrieve those he later determines to be most relevant to his topic. As the data-base continues to grow, the system's usefulness increases. DOE

N88-26805# Carnegie-Mellon Univ., Pittsburgh, PA. Dept. of Psychology.
THE ROLE OF WORKING MEMORY IN LANGUAGE COMPREHENSION
PATRICIA A. CARPENTER and MARCEL A. JUST Feb. 1988 33 p
(Contract N00014-85-K-0584; RR0-4206)
(AD-A192721; ONR-88-1) Avail: NTIS HC A03/MF A01 CSCL 05/8

This chapter provides an account of the transient computational and storage demands that typically arise during comprehension, and of the information management policies that attempt to satisfy those demands. The chapter describes a number of recent studies that examine the trading relation between computation and storage in working memory during language comprehension. Comprehension processes tend to minimize storage requirements by minimizing the number of partial products that have to be stored. The minimization is accomplished by immediately digesting as much of the information from the text as possible (what we have called the immediacy of processing), rather than using a wait-and-see strategy. A second focus is on the differences among individuals in their ability to maintain information in working memory during comprehension. Such individual differences in working memory capacity are closely related to large and stable individual differences in reading comprehension ability. GRA

N88-26837# Air Command and Staff Coll., Maxwell AFB, AL.
COMPUTER-AIDED WRITING
DAVID A. KING Apr. 1988 81 p
(AD-A192516; ACSC-88-1465) Avail: NTIS HC A05/MF A01 CSCL 05/6

The production of written communications is an important and time-consuming activity for most professional organizations. Computer-aided writing offers great potential for increased productivity, quality, and convenience. In addition to word processors, Computer-Aided Writing (CAW) tools include outline processors and prompting programs, electronic dictionaries, style and grammar checkers, logic analyzers, on-line information systems for research, disk-based references, commenting and review software, desktop publishing and typesetting systems, and hypertext systems. The purpose of this research report is to survey the field of Computer-Aided Writing (CAW) tools for use on IBM-compatible Personal Computer (PC) systems. The information presented in this report is intended to acquaint computer resource managers and prospective CAW users with current PC-based CAW technology. Based on an extensive review of recent PC literature and hands-on evaluation of selected CAW products, this report discusses various categories of CAW tools, utility of current products, prospects for future developments, and selection and

planning criteria. The report also specifically addresses the application of CAW technology at the Air Command and Staff College (ACSC) which is the sponsor of this project. GRA

N88-28644# Massachusetts Inst. of Tech., Cambridge.
WALTER USER'S MANUAL (VERSION 1.0)
DAVID K. GIFFORD, ROBERT G. COTE, and DAVID A. SEGAL Sep. 1987 35 p
(Contract N00014-83-K-0125)
(AD-A192542; MIT/LCS/TR-399) Avail: NTIS HC A03/MF A01 CSCL 12/7

Walter is one of the experimental computer systems that is part of the Boston Community Information System Project. Walter allows you to use a UNIX system (including DEC Vaxes, IBM RTs, and Sun Workstations) connected to the DARPA internet to access a 90-day database of the New York Times. Walter implements a simple, yet powerful, full-text query language that allows you to locate information of interest. This user's manual is designed to tell you everything you need to know to use the Walter system. We have prepared this manual for new and experienced UNIX users alike. Most importantly, we hope the manual will answer all your questions about using the program. GRA

N88-30333*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
A SHARED-WORLD CONCEPTUAL MODEL FOR INTEGRATING SPACE STATION LIFE SCIENCES TELESCIENCE OPERATIONS
VICKI JOHNSON and JOHN BOSLEY (Bionetics Corp., Moffett Field, Calif.) *In* NASA, Goddard Space Flight Center, The 1988 Goddard Conference on Space Applications of Artificial Intelligence p 33-44 Aug. 1988
Avail: NTIS HC A19/MF A03 CSCL 09/2

Mental models of the Space Station and its ancillary facilities will be employed by users of the Space Station as they draw upon past experiences, perform tasks, and collectively plan for future activities. The operational environment of the Space Station will incorporate telescience, a new set of operational modes. To investigate properties of the operational environment, distributed users, and the mental models they employ to manipulate resources while conducting telescience, an integrating shared-world conceptual model of Space Station telescience is proposed. The model comprises distributed users and resources (active elements); agents who mediate interactions among these elements on the basis of intelligent processing of shared information; and telescience protocols which structure the interactions of agents as they engage in cooperative, responsive interactions on behalf of users and resources distributed in space and time. Examples from the life sciences are used to instantiate and refine the model's principles. Implications for transaction management and autonomy are discussed. Experiments employing the model are described which the authors intend to conduct using the Space Station Life Sciences Telescience Testbed currently under development at Ames Research Center. Author

N89-14963*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
THE DESIGN OF PC/MISI, A PC-BASED COMMON USER INTERFACE TO REMOTE INFORMATION STORAGE AND RETRIEVAL SYSTEMS M.S. ThesisFinal Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. and PHILIP P. HALL 24 Apr. 1985 97 p Prepared in cooperation with Southern Univ., Baton Rouge, LA
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184523; NAS 1.26:184523; DBMS.NASA/RECON-15)
Avail: NTIS HC A05/MF A01 CSCL 05/2

The amount of information contained in the data bases of large-scale information storage and retrieval systems is very large and growing at a rapid rate. The methods available for assessing this information have not been successful in making the information easily available to the people who have the greatest need for it. This thesis describes the design of a personal computer based system which will provide a means for these individuals to retrieve this data through one standardized interface. The thesis identifies each of the major problems associated with providing access to casual users of IS and R systems and describes the manner in which these problems are to be solved by the utilization of the local processing power of a PC. Additional capabilities, not available with standard access methods, are also provided to improve the user's ability to make use of this information. The design of PC/MISI is intended to facilitate its use as a research vehicle. Evaluation mechanisms and possible areas of future research are described. The PC/MISI development effort is part of a larger research effort directed at improving access to remote IS and R systems. This research effort, supported in part by NASA, is also reviewed. Author

N89-14964*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
THE DESIGN OF PC/MISI, A PC-BASED COMMON USER INTERFACE TO REMOTE INFORMATION STORAGE AND RETRIEVAL SYSTEMS. PRESENTATION VISUALS M.S. Thesis Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. and PHILIP P. HALL 24 Apr. 1985 31 p Prepared in cooperation with Southern Univ., Baton Rouge, LA
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184524; NAS 1.26:184524; DBMS.NASA/RECON-16)
Avail: NTIS HC A03/MF A01 CSCL 05/2

This Working Paper Series entry represents a collection of presentation visuals associated with the companion report entitled, The Design of PC/MISI, a PC-Based Common User Interface to Remote Information Storage and Retrieval Systems, USL/DBMS NASA/RECON Working Paper Series report number DBMS.NASA/RECON-15. The paper discusses the following: problem definition; the PC solution; the goals of system design; the design description; future considerations, the research environment; conclusions. Author

N89-19890*# Essex Corp., Alexandria, VA.
SARSCEST (HUMAN FACTORS)
H. MCILVAINE PARSONS *In* NASA. Lyndon B. Johnson Space Center, 2nd Annual Workshop on Space Operations Automation and Robotics (SOAR 1988) p 541-552 Nov. 1988
Avail: NTIS HC A22/MF A04 CSCL 05/8

People interact with the processes and products of contemporary technology. Individuals are affected by these in various ways and individuals shape them. Such interactions come under the label 'human factors'. To expand the understanding of those to whom the term is relatively unfamiliar, its domain includes both an applied science and applications of knowledge. It means both research and development, with implications of research both for basic science and for development. It encompasses not only design and testing but also training and personnel requirements, even though some unwisely try to split these apart both by name and institutionally. The territory includes more than performance at work, though concentration on that aspect, epitomized in the derivation of the term ergonomics, has overshadowed human factors interest in interactions between technology and the home, health, safety, consumers, children and later life, the handicapped, sports and recreation education, and travel. Two aspects of technology considered most significant for work performance, systems and automation, and several approaches to these, are discussed. Author

N89-20062*# Illinois State Univ., Normal. Dept. of Applied Computer Science.
COMPUTER TECHNOLOGIES AND INSTITUTIONAL MEMORY Final Report
CHRISTOPHER BELL and ROY LACHMAN (Houston Univ., TX.) *In* NASA, Lyndon B. Johnson Space Center, National Aeronautics and Space Administration (NASA)/American Society for Engineering Education (ASEE) Summer Faculty Fellowship Program

1988, Volume 1 22 p Feb. 1989
Avail: NTIS HC A09/MF A02 CSCL 09/2

NASA programs for manned space flight are in their 27th year. Scientists and engineers who worked continuously on the development of aerospace technology during that period are approaching retirement. The resulting loss to the organization will be considerable. Although this problem is general to the NASA community, the problem was explored in terms of the institutional memory and technical expertise of a single individual in the Man-Systems division. The main domain of the expert was spacecraft lighting, which became the subject area for analysis in these studies. The report starts with an analysis of the cumulative expertise and institutional memory of technical employees of organizations such as NASA. A set of solutions to this problem are examined and found inadequate. Two solutions were investigated at length: hypertext and expert systems. Illustrative examples were provided of hypertext and expert system representation of spacecraft lighting. These computer technologies can be used to ameliorate the problem of the loss of invaluable personnel. Author

N89-20695*# Georgia Inst. of Tech., Atlanta. Center for Human-Machine Systems Research.
INTENT INFERENCING WITH A MODEL-BASED OPERATOR'S ASSOCIATE
PATRICIA M. JONES, CHRISTINE M. MITCHELL, and KENNETH S. RUBIN *In its* Human-Computer Interaction in Distributed Supervisory Control Tasks 19 p Jan. 1989
(REPT-88-2) Avail: NTIS HC A08/MF A01 CSCL 09/2

A portion of the Operator Function Model Expert System (OFMspert) research project is described. OFMspert is an architecture for an intelligent operator's associate or assistant that can aid the human operator of a complex, dynamic system. Intelligent aiding requires both understanding and control. The understanding (i.e., intent inferencing) ability of the operator's associate is discussed. Understanding or intent inferencing requires a model of the human operator; the usefulness of an intelligent aid depends directly on the fidelity and completeness of its underlying model. The model chosen for this research is the operator function model (OFM). The OFM represents operator functions, subfunctions, tasks, and actions as a heterarchic-hierarchic network of finite state automata, where the arcs in the network are system triggering events. The OFM provides the structure for intent inferencing in that operator functions and subfunctions correspond to likely operator goals and plans. A blackboard system similar to that of Human Associative Processor (HASP) is proposed as the implementation of intent inferencing function. This system postulates operator intentions based on current system state and attempts to interpret observed operator actions in light of these hypothesized intentions. Author

N89-20696*# Georgia Inst. of Tech., Atlanta. Center for Human-Machine Systems Research.
OFMTUTOR: AN OPERATOR FUNCTION MODEL INTELLIGENT TUTORING SYSTEM
PATRICIA M. JONES *In its* Human-Computer Interaction in Distributed Supervisory Control Tasks 45 p Jan. 1989
Avail: NTIS HC A08/MF A01 CSCL 09/2

The design, implementation, and evaluation of an Operator Function Model intelligent tutoring system (OFMTutor) is presented. OFMTutor is intended to provide intelligent tutoring in the context of complex dynamic systems for which an operator function model (OFM) can be constructed. The human operator's role in such complex, dynamic, and highly automated systems is that of a supervisory controller whose primary responsibilities are routine monitoring and fine-tuning of system parameters and occasional compensation for system abnormalities. The automated systems must support the human operator. One potentially useful form of support is the use of intelligent tutoring systems to teach the operator about the system and how to function within that system. Previous research on intelligent tutoring systems (ITS) is considered. The proposed design for OFMTutor is presented, and an experimental evaluation is described. M.G.

N89-20697*# Georgia Inst. of Tech., Atlanta. Center for Human-Machine Systems Research.
A SURVEY OF INTELLIGENT TUTORING SYSTEMS: IMPLICATIONS FOR COMPLEX DYNAMIC SYSTEMS
ROSE W. CHU *In its* Human-Computer Interaction in Distributed Supervisory Control Tasks 19 p Jan. 1989
Avail: NTIS HC A08/MF A01 CSCL 09/2

An overview of the research in the field of intelligent tutorial systems (ITS) is provided. The various approaches in the design and implementation of ITS are examined and discussed in the context of problem solving in an environment of a complex dynamic system (CDS). Issues pertaining to a CDS and the nature of human problem solving especially in light of a CDS are considered. An overview of the architecture of an ITS is provided as the basis for the in-depth examination of various systems. Finally, the implications for the design and evaluation of an ITS are discussed. Author

N89-20704# Oak Ridge National Lab., TN.
INCREASING USER-FRIENDLINESS IN AI SYSTEMS
ANURAG AGARWAL and M. L. EMRICH Oct. 1988 31 p Presented at the National Governor's Association Meeting: Finding the Future Conference, Washington, DC, 12 Dec. 1988
(Contract DE-AC05-84OR-21400)
(DE89-005093; CONF-881249-3) Avail: NTIS HC A03/MF A01

Recent trends have shown a rise in the number of non-technical computer users. This has resulted in increased emphasis on User Systems Interfaces (USI). New technology which has been developed includes: laser/optical mice, touch screens, voice synthesizers, and voice analyzers. This paper details hardware and software that have been the focus of recent research. The implementation of SOFTMAN, a software manager aid is also discussed. As part of its USI, SOFTMAN has each of the above interfaces. Future technologies and research paths will also be discussed. DOE

N89-23198# Los Alamos National Lab., NM. Theoretical Biology and Biophysics Theoretical Div.
SIMULATION AND ANALYSIS OF PHYSICAL MAPPING
KARL SIROTKIN and JOHN JOSEPH LOEHR 1988 22 p Presented at the Interface Between Computational Science and Nucleic Acid Sequencing, Santa Fe, NM, 12-16 Dec. 1988
(Contract W-7405-ENG-36)
(DE89-009399; LA-UR-89-817; CONF-881276-1) Avail: NTIS HC A03/MF A01

The current talk involves objects smaller than those that are macro-restriction mapped but larger than the bases that are sequenced. Specifically, we describe simulations of the alignment of recombinant lambdoid and cosmid clones by fingerprinting methods. The purpose of the simulation is to compare methods, as realistically as desired, while preparing for the analysis of actual physical mapping data. Furthermore, we will eventually begin to submit data to the Human Genome Information Resource (HGIR) to exercise its database. A simulation has advantages over a formal mathematical analysis. Not only can a simulation be as realistic as desired (for example by using actual sequences from GenBank(trademark)) but if desired properly, when finished much of the code could be used on actual data. Furthermore, a simulation can be designed to utilize any degree of parameterization, while analyses usually must make simplifying assumptions to minimize the number of parameters. For example, the way this simulation is designed one could, by simply adding a short module, mimic rearrangements that might occur during cloning in order to discover the effect that they would have on the contig generating algorithms and to learn how to recognize and deal with such rearrangements. This talk describes the structure and announces the availability of the code for the simulation modules. We tested the method for aligning clones based upon oligonucleotide hybridizing sites comparing its efficacy on actual human DNA sequences from GenBank to its efficacy on random, completely uncorrelated sequence. Surprisingly, its performance was about the same on both sequences. DOE

N89-26470*# FMC Corp., Santa Clara, CA.
AN ARCHITECTURE FOR HEURISTIC CONTROL OF REAL-TIME PROCESSES
P. RAULEFS and P. W. THORNDYKE *In* Jet Propulsion Lab., California Inst. of Tech., Proceedings of the Workshop on Space Telerobotics, Volume 1 p 149-154 1 Jul. 1987
Avail: NTIS HC A16/MF A03 CSCL 09/2

Abstract Process management combines complementary approaches of heuristic reasoning and analytical process control. Management of a continuous process requires monitoring the environment and the controlled system, assessing the ongoing situation, developing and revising planned actions, and controlling the execution of the actions. For knowledge-intensive domains, process management entails the potentially time-stressed cooperation among a variety of expert systems. By redesigning a blackboard control architecture in an object-oriented framework, researchers obtain an approach to process management that considerably extends blackboard control mechanisms and overcomes limitations of blackboard systems. Author

N89-26580*# Maryland Univ., College Park. Dept. of Computer Science.
SHARED RESOURCE CONTROL BETWEEN HUMAN AND COMPUTER
JAMES HENDLER and REID WILSON *In* NASA. Goddard Space Flight Center, The 1989 Goddard Conference on Space Applications of Artificial Intelligence p 13-19 Apr. 1989
Sponsored by part by ONR, Washington, DC
Avail: NTIS HC A17/MF A03 CSCL 09/2

The advantages of an AI system of actively monitoring human control of a shared resource (such as a telerobotic manipulator) are presented. A system is described in which a simple AI planning program gains efficiency by monitoring human actions and recognizing when the actions cause a change in the system's assumed state of the world. This enables the planner to recognize when an interaction occurs between human actions and system goals, and allows maintenance of an up-to-date knowledge of the state of the world and thus informs the operator when human action would undo a goal achieved by the system, when an action would render a system goal unachievable, and efficiently replans the establishment of goals after human intervention. Author

N89-26779# Naval Ocean Systems Center, San Diego, CA. Decision Support and Artificial Intelligence Systems Branch.
AN ASYNCHRONOUS INTERFACE BETWEEN A NATURAL LANGUAGE QUERY INTERPRETER AND A DATABASE MANAGEMENT SYSTEM Final Report, Feb. - Apr. 1988
L. E. GADBOIS Feb. 1989 22 p
(AD-A206918; NOSC/TD-1482) Avail: NTIS HC A03/MF A01 CSCL 12/5

This report documents computer software which interfaces a Data Base Management System (DBMS) to a program which generates database requests. The software described controls the passing of Structured Query Language (SQL) commands into ORACLE and the capture of its output for return to the program which made the request. The software was designed for a DBMS running on a UNIX computer to be accessed by a program on the same or a remote computer. This remote can be running any hardware or operating system which has File Transfer Protocol (FTP) connection with the UNIX machine. GRA

N84-71658# Navy Personnel Research and Development Center, San Diego, CA.
A SYSTEMATIC APPROACH TO HUMAN FACTORS MEASUREMENT
D. MEISTER Oct. 1978 198 p
(AD-A132423; AD-F630038)

N86-70447# Navy Personnel Research and Development Center, San Diego, CA.
DESIGN CONSIDERATIONS FOR HUMAN-COMPUTER DIALOGUES Technical Note
L. R. WILSON Apr. 1977 22 p
(AD-A159265; AD-E301788; NPRDC-TN-77-10)

DECISION SUPPORT

Helping the decision maker has been a long-time goal of computer experts. But decision making in real time scarcely allows consulting computers, networked databases, models. IRM can at least analyze specific situations, and plan quick-reaction decision making strategies. These approaches may be helpful to you.

A84-21644
MODELING AND ANALYSIS OF TEAMS OF INTERACTING DECISIONMAKERS WITH BOUNDED RATIONALITY
K. L. BOETTCHER and A. H. LEVIS (MIT, Cambridge, MA) Automatica (ISSN 0005-1098), vol. 19, Nov. 1983, p. 703-709. refs
(Contract AF-AFOSR-80-0229)
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A methodology for analyzing and evaluating alternative organizational structures is presented. An information theoretic framework is used in which each team member is described by a two-stage model consisting of situation assessment and response selection stages as well as interconnections with the rest of the organization. The information processing and decisionmaking load of each team member and the measure of organizational performance are depicted in the performance-workload space as implicit functions of the decision strategies of each individual member. The approach to evaluating organizational structures using the methodology for analysis of an organization consisting of two decisionmakers with bounded rationality. Author

A84-33463
ARIADNE - A KNOWLEDGE-BASED INTERACTIVE SYSTEM FOR PLANNING AND DECISION SUPPORT
A. P. SAGE and C. C. WHITE, III (Virginia, University, Charlottesville, VA) IEEE Transactions on Systems, Man, and Cybernetics (ISSN 0018-9472), vol. SMC-14, Jan.-Feb. 1984, p. 35-47. refs
(Contract N00014-80-C-0542)
Copyright

The development of an interactive planning and decision support process for multiple criteria alternative selection situations is discussed. Probabilities, utility scores for the lowest level attributes, and attribute trade-off weights, i.e., the parameters, can be imprecisely described by set inclusion. Within a specified structural model of the decision situation, the process allows the decisionmaker to iteratively select the mix of parameter value precision and alternative ranking specificity. By selecting this mix, the decisionmaker is able to direct the alternative selection process in an interactive manner, using alternative selection strategies based on behaviorally meaningful dominance search strategies. Emphasis is placed on the motivation of the research and the behavioral relevance of the support process. References in the bibliography provide further analytical and behavioral discussions related to this process. Author

A85-31792
DEVELOPMENTS IN DECISION SUPPORT SYSTEMS
R. H. BONCZEK, C. W. HOSAPPLE, and A. B. WHINSTON (Purdue University, West Lafayette, IN) IN: Advances in computers. Volume 23. Orlando, FL, Academic Press, Inc., 1984, p. 141-175. refs
(Contract NSF IST-81-08519; NSF ECS-81-16135)
Copyright

A 'Decision Support System' (DSS) is a computerized system which utilizes knowledge about a particular application area to help decision makers working in that area solve ill-structured problems. Ill-structured problems exist in applications related to financial planning, medical diagnosis, operations management, and market planning. The concept and the activities of decision making

are discussed. The information-processing system which makes a decision may be human (individual or group), machine, or a system having both human and machine participation. The latter type of decision-making system is of primary interest in the DSS field. The machine-based portion of the decision-making system constitutes typically a decision support for the human portion. A DSS must possess at least one of the seven decision-making abilities and must exercise that ability in some stage of a decision process. Attention is given to the tools for building a DSS, the essential components of a DSS, trends in the DSS field, and future research directions. G.R.

A88-35463
THE EFFECTS OF DIFFERENT DATA BASE FORMATS ON INFORMATION RETRIEVAL
DEBORAH BOEHM-DAVIS, ROBERT HOLT, MATTHEW KOLL, GLORIA YASTROP, and ROBERT PETERS (George Mason University, Fairfax, VA) IN: Human Factors Society, Annual Meeting, 31st, New York, NY, Oct. 19-23, 1987, Proceedings. Volume 2. Santa Monica, CA, Human Factors Society, 1987, p. 983-986.
(Contract N00014-85-K-0243)
Copyright

This research examined the effects of three different data-base formats on the information retrieval performance of users. Spatial, tabular, and verbal forms of two data-base domains (airline and thesaurus) were constructed along with questions that required users to search through the data base to determine the correct response. Three types of questions were designed: spatial, tabular, and verbal. The data indicate that users are faster and more accurate in responding to the questions when the format of the information in the data base matches the type of information needed to answer the question. While the importance of matching data base format to query type may seem to be obvious, it would appear that the designers of most current data base systems have not taken this into account. Author

A88-46509
THE INVESTIGATIVE TECHNIQUES USED BY THE CHALLENGER COMMISSION TO ADDRESS INFORMATION SYSTEM FAILURES AS THEY RELATED TO THE SPACE SHUTTLE ACCIDENT
RANDY R. KEHRLI (Presidential Commission on the Space Shuttle Challenger, Washington, DC) IN: Information systems: Failure analysis; Proceedings of the NATO Advanced Research Workshop, Bad Windsheim, Federal Republic of Germany, Aug. 18-22, 1986. Berlin and New York, Springer-Verlag, 1987, p. 67-72.
Copyright

A general description of the investigative techniques and methodology used by the Challenger Commission is given. Two aspects of the information system failures found to contribute to the accident by the Commission were listed and placed into the EATPUT model: (1) the decision to launch and (2) the failure to track the history of Shuttle flight problems. The techniques used by the Commission to investigate the various EATPUT event states of NASA's information system are identified. B.J.

A89-27177
A MULTI-SPECTRAL ANALYSIS SYSTEM USING LARGE DATABASES
EDWARD W. BRUGEL, GITTA DOMIK, and STEPHEN A. VOELS (Colorado, University, Boulder) IN: Astronomy from large databases: Scientific objectives and methodological approaches; Proceedings of the Conference, Garching, Federal Republic of Germany, Oct. 12-14, 1987. Garching, Federal Republic of Germany, European Southern Observatory, 1988, p. 3-8.
Copyright

The designing, testing, and implementing of a multispectral data analysis system that incorporates several large astronomical data sets is discussed. The system provides interactive scientific analysis and intercomparison of multimission/multispectral data from satellite and groundbased observatories. Author

N84-33290# Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
AN EVALUATION OF TWO RELIABILITY AND MAINTAINABILITY INFORMATION SYSTEMS M.S. Thesis
L. K. BOCK Jan. 1984 72 p
(AD-A143438; AFIT-LSSR-66-83) Avail: NTIS HC A04/MF A01 CSCL 09/2

Air Force managers require adequate and timely information in order to make effective decisions regarding reliability and maintainability (R&M) issues. Since 1980, at least two Air Force organizations have contracted for additional computer data base systems to improve their R&M data requirements. These data base systems provide real-time maintenance and operational data on certain weapons systems. This study analyzed the output characteristics of these new data base systems to determine if they did provide improved information and comparison with the standard Air Force maintenance and operational data reports. It was shown that the two new data base systems did provide more timely R&M data which resulted in information that allowed for effective and efficient managerial decision making. However, all the timely information available for managerial decisions will be hindered until data input errors are reduced. Author (GRA)

N86-15175*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, TX.
IMPROVING MANAGEMENT DECISION PROCESSES THROUGH CENTRALIZED COMMUNICATION LINKAGES
D. F. SIMANTON and J. R. GARMAN *In its* R and D Productivity: New Challenges for the US Space Program p 202-211 1985
Avail: NTIS HC A25/MF A04 CSCL 05/1

Information flow is a critical element to intelligent and timely decision-making. At NASA's Johnson Space Center the flow of information is being automated through the use of a centralized backbone network. The theoretical basis of this network, its implications to the horizontal and vertical flow of information, and the technical challenges involved in its implementation are the focus of this paper. The importance of the use of common tools among programs and some future concerns related to file transfer, graphics transfer, and merging of voice and data are also discussed. Author

N86-22134# Naval Postgraduate School, Monterey, CA.
A DECISION SUPPORT SYSTEM FOR COST-EFFECTIVENESS ANALYSIS FOR CONTROL AND SECURITY OF COMPUTER SYSTEMS M.S. Thesis
E. A. PREVENAS Sep. 1985 152 p
(AD-A161388) Avail: NTIS HC A08/MF A01 CSCL 09/2

The increasing number of computer failures and crimes has forced managers to tighten the control procedures of their EDP systems. However, the cost of an exhaustive control strategy is often very expensive, and its effectiveness is not guaranteed. This thesis designs and implements a Decision Support System that helps determine optimal control procedures for EDP systems (CEA-DSS). The model base of the proposed DSS consists of various techniques for estimating computer exposures. The latter can be interactively analyzed via a Dialogue interface that supports tabular and graphic outputs. CEA-DSS also provides extensive database management capabilities to keep track of the diverse control problems. It is implemented in PASCAL for the IBM-PC. GRA

N86-25992# Engineering Research Associates, Inc., Vienna, VA.
SCHEMA-BASED THEORY OF INFORMATION PRESENTATION FOR DISTRIBUTED DECISION MAKING Interim Report
D. F. NOBLE and J. A. TRUELOVE Aug. 1985 120 p refs
(Contract N00014-84-C-0484)
(AD-A163150; R-028-85) Avail: NTIS HC A06/MF A01 CSCL 05/10

The Schema-Based Theory of Information Presentation for Distributed Decision Making describes a schema structure appropriate for understanding connections between the way that information is presented and its impact on distributed decision

making. The theory suggests a process for determining how information should be presented so that consensus and coordination will be improved and decision conflicts will be reduced. The theory proposes that experienced decision makers select alternatives by mental processes that match the features of the current situation to features of reference situations for which possible alternatives are known to be appropriate. These reference situations may specify particular threat activities and dispositions, own Battle Group objectives, prescribed contingency plan action, and decision behavior of other decision makers to the group. Information presented according to the principles derived from the theory will encourage each decision maker to more fully consider the impact of each action on the objectives of other decision makers. Applying the principles requires that the general schema used by decision makers be determined prior to the time when particular situation-specific information is presented. Given this prior determination, the principles sugg est what emphasis needs to be given to specific features and feature relationships in the presentation of the current situation. GRA

N86-28798# Engineering Sciences Data Unit, London (England).
THE COSTS OF NOT HAVING REFINED INFORMATION
A. J. BARRETT *In* AGARD The Value of Information as an Integral Part of Aerospace and Defence R and D Programmes 9 p Jan. 1986
Copyright Avail: NTIS HC A05/MF A01

The adequacy of the information resources, which are called upon for support at decision points in the research-design-production-marketing process, can in part be measured by their scope, the presence or absence of information within that scope and, increasingly, by the extent to which they offer refinement in terms of the timeliness and quality of the information which can be retrieved. Timeliness in the present context relates not so much to the response time of the information system as to the extent to which that system is tuned to the volatility of the information which it contains. Likewise, the quality of information is not to be judged only by its relevance and authenticity but also by the convenience of its form of presentation in the view of the decision maker who has need of it. The main focal points of the paper are the costs, disruption and other losses which arise from a lack of knowledge of previous work, the use of out-of-date technical information and, in particular, the extent to which the use of insufficiently refined numerical data leads to the under-, or over-, design of hardware. These are illustrated by a number of quantified examples. The transition from an industrially based to an information or service based society highlights the growing needs of the R&D decision maker and others for systems which will provide high quality numerical and factual data. However, substantiation of these needs may never be available in terms of evidence of direct future benefits as distinct from evidence of historic losses. More dynamic means of demonstrating the impact of information quality upon the interests of the decision maker must be devised and guidelines for two such projects are suggested. Author

N86-29722# Air Force Inst. of Tech., Wright-Patterson AFB, OH.
A STRUCTURAL OPTIMIZATION METHOD FOR INFORMATION RESOURCE MANAGEMENT Ph.D. Thesis
R. E. PESCHKE Dec. 1985 234 p
(AD-A166420; AFIT/CI/NR-86-12D) Avail: NTIS HC A11/MF A02 CSCL 05/1

The mainstays of management activity and managers have traditionally been the organizational resources of manpower, money, material and machines. The inclusion of these support resources early in the acquisition process has had a significant impact on the support of major systems. However, traditional management of these resources alone, is no longer adequate to insure the successful accomplishment of organizational goals and objectives. Organizational planning must include information and information systems in the early stages of the development process if system activities are to continue to insure mission support. The application of a multiattribute design methodology is a practical way to describe alternative versions of a proposed information system. This research makes a contribution to the Information Resource Management concept by developing a structured optimization methodology that will allow the designer-planner to efficiently guide the information system design process toward consistently meeting the IRM requirements of the organization. Additionally, this research devel ops a formal criterion function modeling procedure that evaluates alternative candidate systems through explicit analysis of both qualitative and quantitative criteria. GRA

N87-19913# Massachusetts Inst. of Tech., Cambridge. Dept. of Mechanical Engineering.
OPTIMAL COMBINATION OF INFORMATION FROM MULTIPLE SOURCES, PART 3 Final Report, Mar. 1983 - Jul. 1986
MAX B. MENDEL and THOMAS B. SHERIDAN 31 Jul. 1986 69 p
(Contract N00014-83-K-0193)
(AD-A174726) Avail: NTIS HC A04/MF A01 CSCL 05/8

A computer decision aiding system for debiasing and combining information from multiple sources (e.g., human experts, sensors) is proposed. The algorithm is based on six assumptions that apply when the sources are relately knowledgeable with respect to the operator on the variable of interest, and the operator is willing to base his evaluation of their performance on a previously selected (finite) sequence of so called calibration variables. It is also assumed that the operator is interested in maximizing gains, that is, he wishes to act in an optimal or Bayesian manner. An experiment with two human sources of information was conducted to evaluate the performance of the aiding system under a variety of loss functions. On a family of bilinear loss functions, the output of the aid was found to perform better than a naive scheme like simply believing the information the two sources gave. The combination rule was also found to perform better than the output to any individual source. Author (GRA)

N87-20128# Massachusetts Inst. of Tech., Cambridge. Man-Machine Systems Lab.
SATISFICING DECISION-MAKING IN SUPERVISORY CONTROL, PART 2 Final Report, Mar. 1983 - Jul. 1986
LEONID CHARNY and THOMAS B. SHERIDAN 31 Jul. 1986 59 p
(Contract N00014-83-K-0193)
(AD-A174631) Avail: NTIS HC A04/MF A01 CSCL 05/1

This paper describes a flexible graphics system GraMAD for aiding a human decision-maker in making a selection out of a discrete set of alternatives while trading off several criteria. Three major components of this selection process, called satisficing, are identified and three modes of information presentation to the decision-maker are studied. Necessary elements of multiple-objective computer aiding systems are discussed. Results of experiments with human subjects working with the GraMAD system are discussed. GRA

N88-20820# Decision Science Consortium, Inc., Falls Church, VA.
A PERSONALIZED AND PRESCRIPTIVE DECISION AID FOR CHOICE FROM A DATABASE OF OPTIONS Final Technical Report, Jul. 1983 - Sep. 1986
MARVIN S. COHEN, KATHRYN B. LASKEY, and MARTIN A. TOLCOTT 23 Nov. 1987 71 p
(Contract N00014-83-C-0485; PROJ. F66-701)
(AD-A188726; DSCI-87-18) Avail: NTIS HC A04/MF A01 CSCL 05/8

In many decision making contexts there is a need for aids which cater flexibly to individual users in their preferred ways of organizing information and solving problems, but which guard against potential errors or biases inherent in common approaches to decision making. DSC has developed principles of personalized and prescriptive decision aiding which respond to this need, and which are based on experimental findings and theoretical models in cognitive psychology. In Phase 1 of this project, those principles

were applied to the development of an aid for attack submarine approach and attack. In Phase 2, the principles have been generalized and extended to the development of a generic personalized and prescriptive evaluation system. The system incorporates five basic cognitive interface modules to customize the user's interaction with the aid to provide prescriptive guidance, as well as a set of interactive dialogues or guides which blend all five functions in support of specific user-selected decision-making strategies. The aid has been tested and demonstrated in the context of a personnel application. GRA

N89-11408# California Univ., Berkeley. Computer Science Div.
PRECISION-TIME TRADEOFFS: A PARADIGM FOR PROCESSING STATISTICAL QUERIES ON DATABASES
JAIDEEP SRIVASTAVA and DORON ROTEM (California Univ., Berkeley. Lawrence Berkeley Lab.) May 1988 22 p Presented at the 4th International Working Conference on Statistical and Scientific Database Management, Rome, Italy, 21 Jun. 1988
(Contract DE-AC03-76SF-00098)
(DE88-012024; LBL-24767; CONF-8806166-1) Avail: NTIS HC A03/MF A01

Conventional query processing techniques are aimed at queries which access small amounts of data, and require each data item for the answer. In case the database is used for statistical analysis as well as operational purposes, for some types of queries a large part of the database may be required to compute the answer. This may lead to a data access bottleneck, caused by the excessive number of disk assesses needed to get the data into primary memory. An example is computation of statistical parameters, such as count, average, median, and standard deviation, which are useful for statistical analysis of the database. Yet another example that faces this bottleneck is the verification of the truth of a set of predicates (goals), based on the current database state, for the purposes of intelligent decision making. A solution to this problem is to maintain a set of precomputed information about the database in a view or a snapshot. Statistical queries can be processed using the view rather than the real database. A crucial issue is that the precision of the precomputed information in the view deteriorates with time, because of the dynamic nature of the underlying database. Thus the answer provided is approximate, which is acceptable under many circumstances, especially when the error is bounded. DOE

N89-13918# Pacific Northwest Lab., Richland, WA.
EXPERIENCES WITH A DATA ANALYSIS MANAGEMENT PROTOTYPE
PAULA J. COWLEY, DANIEL B. CARR, and WESLEY L. NICHOLSON *In* Colorado State Univ., Computer Science and Statistics. Proceedings of the 18th Symposium on the Interface p 147-150 26 Aug. 1987 Previously announced as N87-11626
Avail: NTIS HC A20/MF A03 CSCL 05/2

An evaluation of a prototype data analysis management system is presented. This system was designed to aid the analyst in keeping track of the course of a data analysis. Evaluated features include capabilities to graphically depict the course of the analysis, to return to previous milestones in the analysis, the ability to use segments of the log that describe the course of the analysis, and the ability to associate both written and spoken documentation with milestones of the analysis. Author

N89-13919# Chicago Univ., IL.
TOOLS FOR DATA ANALYSIS MANAGEMENT
RONALD A. THISTED *In* Colorado State Univ., Computer Science and Statistics. Proceedings of the 18th Symposium on the Interface p 152-159 26 Aug. 1987
(Contract NSF DMS-84-12233)
Avail: NTIS HC A20/MF A03 CSCL 12/6

Interactive statistical computer programs represent one class of tools which have made it easier for statisticians to carry out the computations associated with data analysis. Additional tools, both software and hardware, which can be combined with interactive statistical packages to make it easier for the statistician to implement a personal strategy for analyzing data are discussed. An integrated collection of tools for data analysis is called a computing environment. The DAMSL computing environment which is built around off-the-shelf hardware and software costing less than $4,000 is described. This environment is designed to alleviate many of the managerial burdens which arise in analyzing data. Author

N89-13995*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
THE ENVIRONMENT FOR APPLICATION SOFTWARE INTEGRATION AND EXECUTION (EASIE), VERSION 1.0. VOLUME 2: PROGRAM INTEGRATION GUIDE
KENNIE H. JONES, DONALD P. RANDALL, SCOTT S. STALLCUP (Computer Sciences Corp., Hampton, Va.), and LAWRENCE F. ROWELL Dec. 1988 121 p
(NASA-TM-100574; NAS 1.15:100574) Avail: NTIS HC A06/MF A01 CSCL 09/2

The Environment for Application Software Integration and Execution, EASIE, provides a methodology and a set of software utility programs to ease the task of coordinating engineering design and analysis codes. EASIE was designed to meet the needs of conceptual design engineers that face the task of integrating many stand-alone engineering analysis programs. Using EASIE, programs are integrated through a relational data base management system. In volume 2, the use of a SYSTEM LIBRARY PROCESSOR is used to construct a DATA DICTIONARY describing all relations defined in the data base, and a TEMPLATE LIBRARY. A TEMPLATE is a description of all subsets of relations (including conditional selection criteria and sorting specifications) to be accessed as input or output for a given application. Together, these form the SYSTEM LIBRARY which is used to automatically produce the data base schema, FORTRAN subroutines to retrieve/store data from/to the data base, and instructions to a generic REVIEWER program providing review/modification of data for a given template. Automation of these functions eliminates much of the tedious, error prone work required by the usual approach to data base integration. Author

N89-14473*# Lockheed Missiles and Space Co., Palo Alto, CA.
APPLICATION DEVELOPER'S TUTORIAL FOR THE CSM TESTBED ARCHITECTURE
PHILLIP UNDERWOOD and CARLOS A. FELIPPA (Colorado Univ., Boulder.) Oct. 1988 94 p
(Contract NAS1-18444)
(NASA-CR-181732; NAS 1.26:181732; LMSC/D878511) Avail: NTIS HC A05/MF A01 CSCL 20/11

This tutorial serves as an illustration of the use of the programmer interface on the CSM Testbed Architecture (NICE). It presents a complete, but simple, introduction to using both the GAL-DBM (Global Access Library-Database Manager) and CLIP (Command Language Interface Program) to write a NICE processor. Familiarity with the CSM Testbed architecture is required. Author

N89-14954*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
CONCEPTS AND IMPLEMENTATIONS OF NATURAL LANGUAGE QUERY SYSTEMS Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. and I-HSIUNG LIU 1 Jun. 1984 48 p Prepared in cooperation with Southern Univ., Baton Rouge, LA
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184514; NAS 1.26:184514; DBMS.NASA/RECON-6)
Avail: NTIS HC A03/MF A01 CSCL 05/2

The currently developed user language interfaces of information systems are generally intended for serious users. These interfaces commonly ignore potentially the largest user group, i.e., casual users. This project discusses the concepts and implementations of a natural query language system which satisfy the nature and information needs of casual users by allowing them to communicate with the system in the form of their native (natural) language. In addition, a framework for the development of such an interface is

also introduced for the MADAM (Multics Approach to Data Access and Management) system at the University of Southwestern Louisiana. Author

N89-15330# Sandia National Labs., Albuquerque, NM. Interconnections Div.
DEVELOPING A CONNECTOR SELECTION DEMS USING NIAM (NIJSSEN'S INFORMATION ANALYSIS METHODOLOGY)
NICOLE E. SEVIER Sep. 1988 20 p
(Contract DE-AC04-76DP-00789)
(DE89-001658; SAND-88-0272) Avail: NTIS HC A03/MF A01

At Sandia there exist over 1200 qualified electrical connectors that an engineer can chose from for a given application. Currently, engineers select a connector from a small group of familiar connectors. This technique may not select the connector which is best suited for the application. To assist engineers in selecting the most suitable connector from those available, a user friendly, menu driven database was required. Nijssen's Information Analysis Methodology (NIAM), a conceptual information modeling technique, was used to characterize the connector data requirements. NIAM gives the designer techniques for gathering, modeling, and analyzing information. The major benefit of the NIAM was the ability to gain acceptance and approval of the conceptual model from management and users. The conceptual model may then be implemented in any specified database management system. This paper will discuss the development of the connector selection database at Sandia using NIAM. DOE

N89-15774 Maryland Univ., College Park.
ON QUERY PROCESSING IN DISTRIBUTED DATABASE SYSTEMS Ph.D. Thesis
HYUNCHUL KANG 1987 113 p
Avail: Univ. Microfilms Order No. DA8808565

Processing a query in distributed data base systems requires data transmission among the different sites of the computer network. The optimization of data transmission cost is the major concern in distributed query processing. To optimize the amount of data transmission, the semijoin was used as an effective operator for reducing relations before they are transmitted for the final joins. A new approach is proposed for distributed query optimization which is based on combining semijoins and joins. First, simulation results are reported which indicate that such a semijoin-join integrated approach would be more effective than a solely semijoin-based approach. Then, a semijoin-join integrated query optimization technique and an algorithm SMJ + J for generating a semijoin-join program, a sequence of semijoins and/or joins is presented. An optimal semijoin-join program is derived for a single join query, and the single join query optimization is used as the basis for generating an efficient semijoin-join program for a general join query. The performance of the semijoin-join program is evaluated. Some extensions to the proposed optimization technique are also considered. Dissert. Abstr.

N89-19891*# Boeing Aerospace Co., Kennedy Space Center, FL.
ELECTRONIC DATA GENERATION AND DISPLAY SYSTEM
JULES WETEKAMM *In* NASA. Lyndon B. Johnson Space Center, 2nd Annual Workshop on Space Operations Automation and Robotics (SOAR 1988) p 553-557 Nov. 1988
Avail: NTIS HC A22/MF A04 CSCL 05/2

The Electronic Data Generation and Display System (EDGADS) is a field tested paperless technical manual system. The authoring provides subject matter experts the option of developing procedureware from digital or hardcopy inputs of technical information from text, graphics, pictures, and recorded media (video, audio, etc.). The display system provides multi-window presentations of graphics, pictures, animations, and action sequences with text and audio overlays on high resolution color CRT and monochrome portable displays. The database management system allows direct access via hierarchical menus, keyword name, ID number, voice command or touch of a screen pictoral of the item (ICON). It contains operations and maintenance technical information at three levels of intelligence for a total system. Author

N89-20717*# Illinois Univ., Urbana. Dept. of Computer Science.
MONOTONICALLY IMPROVING APPROXIMATE ANSWERS TO RELATIONAL ALGEBRA QUERIES
KENNETH P. SMITH and J. W. S. LIU 4 Apr. 1989 20 p
(Contract NAG1-613; N00014-87-K-0827)
(NASA-CR-184874; NAS 1.26:184874) Avail: NTIS HC A03/MF A01 CSCL 12/1

We present here a query processing method that produces approximate answers to queries posed in standard relational algebra. This method is monotone in the sense that the accuracy of the approximate result improves with the amount of time spent producing the result. This strategy enables us to trade the time to produce the result for the accuracy of the result. An approximate relational model that characterizes approximate relations and a partial order for comparing them is developed. Relational operators which operate on and return approximate relations are defined. Author

N89-21538*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
THE ENVIRONMENT FOR APPLICATION SOFTWARE INTEGRATION AND EXECUTION (EASIE) VERSION 1.0. VOLUME 1: EXECUTIVE OVERVIEW
LAWRENCE F. ROWELL and JOHN S. DAVIS (Computer Sciences Corp., Hampton, VA.) Mar. 1989 41 p
(NASA-TM-100573; NAS 1.15:100573) Avail: NTIS HC A03/MF A01 CSCL 09/2

The Environment for Application Software Integration and Execution (EASIE) provides a methodology and a set of software utility programs to ease the task of coordinating engineering design and analysis codes. EASIE was designed to meet the needs of conceptual design engineers that face the task of integrating many stand-alone engineering analysis programs. Using EASIE, programs are integrated through a relational database management system. Volume 1, Executive Overview, gives an overview of the functions provided by EASIE and describes their use. Three operational design systems based upon the EASIE software are briefly described. Author

N89-21705 Purdue Univ., West Lafayette, IN.
INFORMATION ACQUISITION FOR MODEL CONSTRUCTION: AN INTEGRATIVE, DECISION-THEORETIC PERSPECTIVE Ph.D. Thesis
RAMAKRISHNAN PAKATH 1988 140 p
Avail: Univ. Microfilms Order No. DA8900713

Most mathematical models of decision making assume that either complete and accurate input parameter information is freely and readily available or that one must resort to probabilistic modeling when dealing with uncertain information. Very often, the decision maker has the time and resources needed for acquiring information. Further, practicing decision makers favor easily understood and implemented satisfying (satisfying + sacrificing) solution methods for the decision models constructed, as opposed to complicated optimization techniques. This is a key requirement for decision support system design. The use of meta models that guide the decision model specification process are proposed and appropriate decision strategies are suggested. Such meta models assume the decider can choose from several information completeness levels with the consequential effects on both information costs and decision quality. Examples of the construction and solution of such meta models in the context of static and dynamic decision scenarios are presented. Dissert. Abstr.

N89-22327# Ohio State Univ., Columbus.
AERONAUTICAL DECISION MAKING: COCKPIT RESOURCE MANAGEMENT Final Report
RICHARD S. JENSEN Jan. 1989 179 p Prepared for Systems Control Technology, Inc., Arlington, VA

(Contract DTFA01-80-C-10080)
(AD-A205115; DOT/FAA/PM-86/46) Avail: NTIS HC A09/MF A01 CSCL 05/8

Aviation accident data indicate that the majority of aircraft mishaps are due to judgment error. This training manual is part of a project to develop materials and techniques to help improve pilot decision making. Training programs using prototype versions of these materials have demonstrated substantial reductions in pilot error rates. The results of such tests were statistically significant and ranged from approximately 10 to 50 percent fewer mistakes. This manual is designed to explain the risks associated with flying activities involving multi-crew aircraft, the underlying behavioral causes of typical accidents, and the effects of stress on pilot decision making. The objective of this material is to enhance interpersonal communication and to facilitate effective leadership and coordination between crewmembers. It provides a sophisticated approach to developing concerted action based on optimal decision making. Several Cockpit Resources Management (CRM) principles are presented in the manual; included are delegation of responsibilities, prioritization, vigilance and monitoring, joint discussion and planning, and receptive leadership techniques. This manual is one of a series on Aeronautical Decision Making (ADM) prepared for the following pilot audiences: Student and Private, Instructor, Instrument, Helicopter, and Multi-crew. GRA

N89-22532# Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Systems and Logistics.
STRUCTURED REQUIREMENTS DETERMINATION FOR INFORMATION RESOURCES MANAGEMENT M.S. Thesis
TAMARA C. MACKENTHUN Dec. 1988 102 p
(AD-A204764; AFIT/GIR/LSQ/88D-8) Avail: NTIS HC A06/MF A01 CSCL 12/7

The purpose of this thesis was to provide the Information Resources Management System designer with a framework on which to structure the decisions which must be made in order to translate rapidly changing information needs into plans for Information Resources Management Systems which implement rapidly changing technology. The HyperCard programming environment and the Design/IDEF diagramming tool were used to develop a design support system which guides the Information Resources Management (IRM) system designer through the requirements determination stage of Dr. Benjamin Ostrofsky's Design, Planning and Development Methodology. This system consists of the Design, Planning and Development (D, P and D) Stack, a Help stack, and a User's Manual. The system guides the IRM system designer through the requirements determination process, assists in the collection of data, and organizes that data into a form which can be subjected to objective analysis and optimization. The system currently supports only the requirements determination phase of a complete Information Resources Management System design methodology. It is intended to serve as input to future development of a complete system to assist the Information Resources Management System designer with all phases of the design process. GRA

N89-70498 Office of Science and Technology, Washington, DC.
RESEARCH AND DEVELOPMENT STRATEGY FOR HIGH PERFORMANCE COMPUTING
20 Nov. 1987 33 p
(PB89-120778) Avail: NTIS

APPLICATIONS TO SPECIAL AREAS

We all work in specialized subject and mission areas. Is an application in an activity that looks pertinent actually applicable? Brainstorming techniques indicate that approaches far afield might have a chance. Here are some applications.

A85-14170
DATA DISSEMINATION AND ONLINE NUMERIC DATABASE SYSTEMS
H. MINDLIN (Battelle Columbus Laboratories, Columbus, OH) SAMPE Quarterly (ISSN 0036-0821), vol. 16, Oct. 1984, p. 34-38. refs
Copyright

The development of handbooks, databanks, and databases is described through the steps required in the collection, review, and analysis procedures. Examples of current handbooks and databooks are presented. The end use of a database is a key factor in determining what data will be saved, how it will be analyzed, and how it will be presented in the final product. Even if databases are developed from databanks, it is useful if the source data and online analysis programs are accessible to the end user. Databases are increasing in use and will eventually replace the off-the-shelf handbook. Author

A85-26824
A SYSTEMS APPROACH TO ATE DOCUMENTATION
V. RILEY, D. BAUM, and R. VESTEWIG (Honeywell Systems and Research Center, Minneapolis, MN) IN: AUTOTESTCON '83; Proceedings of the Conference, Fort Worth, TX, November 1-3, 1983. New York, Institute of Electrical and Electronics Engineers, Inc., 1983, p. 336-341.
Copyright

The time savings provided by a Voice Interactive Maintenance Aiding Device (VIMAD) for automated equipment testing applications are considered. The VIMAD is an information storage and presentation device which tailors the form of the presentation to both the type of information required and the task to be performed. At the core of the system helmet mounted, or handheld CRT display attached remotely to a microcomputer. The helmet holds a microphone for voice input to the computer. When technical documentation of a system under test is needed, a voice command signals the microcomputer to display the drawing on the CRT. The system can store up to 15,000 color images on a single optical disk, with random access to any frame in under half a second. In the future, the development of smaller high resolution versions of the VIMAD may make it possible to present detailed written information. A functional block diagram of the VIMAD system is provided. I.H.

A85-41058#
PILOTS WARY OF TACTICAL INFORMATION SYSTEMS
R. DEMEIS Aerospace America (ISSN 0740-722X), vol. 23, July 1985, p. 70-73.
Copyright

The Joint Tactical Information Distribution System (JTIDS) employs frequency hopping techniques to furnish real time, secure, antijam digital data transfer and voice communications to remote terminals, automatically distinguishing between friend and foe and collecting navigation data relative to a master platform, such as an AWACS aircraft. In addition to the prospective air engagement advantages anticipated for JTIDS by the U.S. Air Force, the cost and complexity that have become associated with the system to date and the operational difficulties cited by pilots acquainted with test units of the JTIDS system are discussed. O.C.

A85-44992
INTEGRATED TERRAIN ACCESS/RETRIEVAL SYSTEM
G. O. BURNHAM (Texas Instruments, Inc., Lewisville) IN: NAECON 1984; Proceedings of the National Aerospace and

Electronics Conference, Dayton, OH, May 21-25, 1984. Volume 1. New York, IEEE, 1984, p. 97-105.
Copyright

The ITARS program objective is to develop and demonstrate a flightworthy digital terrain access and retrieval system, implemented with a flexible VHSIC-based modular architecture. The ITARS will interface to and support a variety of avionics subsystems and functions including TF/TA, navigation, threat avoidance, and displays. As such, the ITARS will be ideally situated to take advantage of and bring together major current-technology thrusts: digital map technology, VHSIC technology, and Air Force Pave Pillar/ASID programs. To successfully merge these three technologies into the ITARS, the program must systematically address several issues such as: (1) how digital terrain data are used to support pilot needs including TF/TA, navigation, threat avoidance, and displays; (2) what is the digital map technology required to support these functions; (3) what flightworthy system implementation best supports these requirements. This paper presents the approach, schedule, and results from preliminary studies conducted to support Digital Map technology required for ITARS. Specific topics to be discussed include data base requirements, alternate digital terrain data sources, and mission needs. Author

A86-20669*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE PILOT CLIMATE DATA SYSTEM
M. G. REPH, L. A. TREINISH, and P. H. SMITH (NASA, Goddard Space Flight Center, Greenbelt, MD) IN: Spatial information technologies for remote sensing today and tomorrow; Proceedings of the Ninth Pecora Symposium, Sioux Falls, SD, October 2-4, 1984. Silver Spring, MD, Institute of Electrical and Electronics Engineers, Inc., 1984, p. 132-139. refs

The Pilot Climate Data System (PCDS) is an interactive scientific information management system for locating, obtaining, manipulating, and displaying climate-research data. The PCDS was developed to manage a large collection of data of interest to the National Aeronautics and Space Administration's (NASA) research community and currently provides such support for approximately twenty data sets. In order to provide the PCDS capabilities, NASA's Goddard Space Flight Center (NASA/GSFC) has integrated the capabilities of several general-purpose software packages with specialized software for reading and reformatting the supported data sets. These capabilities were integrated in a manner which allows the PCDS to be easily expanded, either to provide support for additional data sets or to provide additional functional capabilities. This also allows the PCDS to take advantage of new technology as it becomes available, since parts of the system can be replaced with more powerful components without significantly affecting the user interface. Author

A87-13162
COMPUTERIZED NUMERIC DATABASES FOR MATERIALS PROPERTIES
J. G. KAUFMAN IN: International SAMPE Symposium and Exhibition, 31st, Los Angeles, CA, April 7-10, 1986, Proceedings. Covina, CA, Society for the Advancement of Material and Process Engineering, 1986, p. 1488-1498. refs
Copyright

The National Materials Property Data Network has been established in order to furnish engineers and scientists with on-line access to sources of material property data with which selection and design decisions can be made. In order to present a comprehensive view of the opportunities and limitations that must influence judgements on the reliability and quality attributable to those sources, information is presently provided on a number of the sources in tabular form. Attention is given to (1) average, minimum and individual test results; (2) the degree to which individual sets of data are available and retrievable; (3) the available amount of documentation on the test methods by which the given data were generated; and (4) the extent to which data have been evaluated by materials/testing experts with respect to their consistency and reliability. It is noted that while most data sources cover metals, only a few cover polymers, and no public systems have been found which cover ceramics or composites. O.C.

A87-13182
EXPERIENCE, METHODS AND PROSPECTS IN COMMERCIAL ONLINE MATERIALS DATA DISTRIBUTION
H. D. CHAFE IN: International SAMPE Symposium and Exhibition, 31st, Los Angeles, CA, April 7-10, 1986, Proceedings. Covina, CA, Society for the Advancement of Material and Process Engineering, 1986, p. 1798-1806.
Copyright

The 'Metals Datafile' experimental data bank of numerical property values based on the metals literature was developed with online network availability in mind, and encompasses one segment limited to metallic compositions and a second that includes a total of 21 of such material property values as tensile strength, yield point, shear, impact and rupture strengths, hardness, modulus of elasticity, fatigue life, and fracture toughness. Physical properties such as density, specific heat and thermal and electrical characteristics are also included. In the full test year of 1984, an average of 29 organizations accessed the Datafile each month; more than two-thirds of this usage is noted to have originated outside the U.S., with at least 10 different countries being represented per month. O.C.

A87-13537#
GPS/JTIDS COMPATIBILITY
R. C. CUMMING, R. L. HEINZE, and R. R. MOSER, JR. (SRI International, Menlo Park, CA) IN: ION, National Technical Meeting, Long Beach, CA, January 21-23, 1986, Proceedings. Washington, DC, Institute of Navigation, 1986, p. 35-40.

A technical evaluation shows that a GPS manpack receiver can function without degradation when Position Location and Reporting System, and Joint Tactical Information Distribution System (JTIDS), transmitters are operating within close proximity under the experimental conditions. In the laboratory tests, the GPS receiver was shown to acquire synchronization with four satellites while +30 dBm of JTIDS power was coupled into its antenna port in less than one minute, and a similar test demonstrated good performance with the output filter removed. During on-the-air tests which used a GRID Compass computer to display the system parameters, the GPS unit acquired the four satellites in less than two minutes under interference conditions and with the transmitters running. R.R.

A87-48577*# National Aeronautics and Space Administration, Washington, DC.
NASA SPACE INFORMATION SYSTEMS OVERVIEW
DANA L. HALL (NASA, Washington, DC) AIAA and NASA, International Symposium on Space Information Systems in the Space Station Era, Washington, DC, June 22, 23, 1987. 7 p. refs
(AIAA PAPER 87-2189) Copyright

A major objective of NASA space missions is the gathering of information that when analyzed, compared, and interpreted furthers man's knowledge of his planet and surrounding universe. A space information system is the combination of data gathering, data processing, and data transport capabilities that interact to provide the underlying services that enable that advancement in understanding. Past space projects have been characterized by rather disjoint data systems that often did not satisfy user requirements. NASA has learned from those experiences, however, and now is conceptualizing a new generation of sophisticated, integrated space information systems suitable to the wide range of near future space endeavors. This paper examines the characteristics of recent data systems and, based upon that characterization, outlines the scope and attributes of future systems. A description if offered of the information system for the Space Station Program as one real example of such advanced capabilities. Author

A87-48600*# National Aeronautics and Space Administration, Washington, DC.
TECHNICAL AND MANAGEMENT INFORMATION SYSTEM (TMIS)
TIMOTHY R. RAU (NASA, Washington, DC) AIAA and NASA, International Symposium on Space Information Systems in the Space Station Era, Washington, DC, June 22, 23, 1987. 10 p.
(AIAA PAPER 87-2217) Copyright

The TMIS goals developed to support the Space Station Program (SSP) mission requirements are outlined. The TMIS will provide common capabilities to all SSP centers and facilitate the flow of technical and management information throughout the program as well as SSP decision-making processes. A summary is presented of the various TMIS phases. K.K.

A87-49213
SATISFYING THE INFORMATION REQUIREMENTS OF AN AIRCRAFT T&E CENTER
DANNY WEDDLE (U.S. Navy, Naval Air Test Center, Patuxent River, MD) IN: Society of Flight Test Engineers, Annual Symposium, 17th, Washington, DC, Aug. 10-14, 1986, Proceedings. Lancaster, CA, Society of Flight Test Engineers, 1986, p. 6.2-1 to 6.2-6. refs
Copyright

Consideration is given to the way in which the Naval Air Test Center attempts to satisfy information requirements connected with the development of a technical baseline for the system being tested and the use of key decision information for managing and operating the center. On the technical side, laboratories and data processing systems have been established to produce test information in a simulated or real environment. On the management side, a Computer Assisted Management System project and prototype information systems have been established to satisfy the needs of management at all levels. In addition, an Information Resources Management Office has been established whose task is to develop corporate information policy. B.J.

A87-53207* Woods Hole Oceanographic Inst., MA.
A SYSTEMS-APPROACH TO THE DESIGN OF THE EOS DATA AND INFORMATION SYSTEM
ROBERT R. P. CHASE (Woods Hole Oceanographic Institution, MA) IN: IGARSS '87 - International Geoscience and Remote Sensing Symposium, Ann Arbor, MI, May 18-21, 1987, Digest. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1987, p. 887-891.
(Contract NAGW-946)
Copyright

The task of designing a data and information system responsive to the needs of Eos users is stratified by level and approached with contemporary systems design practices. Appropriate systems design principles are applied at the conceptual design level in this paper. A functional, architectural design is described in terms of elemental composition, top-level functions, and external and internal interfaces. The functional validity of this design has been tested and verified through the use of realistic user scenarios consistent with existing plans for the 1990s, the Space Station era. Technologic and management impediments to the development of the requisite data and information system for Eos are examined and a consistent methodology for developing this system is discussed. Author

A87-53230* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE LAND ANALYSIS SYSTEM (LAS) - A GENERAL PURPOSE SYSTEM FOR MULTISPECTRAL IMAGE PROCESSING
STEPHEN W. WHARTON and YUN-CHI LU (NASA, Goddard Space Flight Center, Greenbelt, MD) IN: IGARSS '87 - International Geoscience and Remote Sensing Symposium, Ann Arbor, MI, May 18-21, 1987, Digest. Volume 2. New York, Institute of Electrical and Electronics Engineers, Inc., 1987, p. 1081-1086. refs
Copyright

The present, general-purpose Land Analysis System (LAS) for image processing furnishes a comprehensive set of functions for the manipulation of MSS data; the initial version has more than 240 functions and utilities ranging from pixel manipulation to complex classification. A LAS user's guide describes each such function in terms of purpose, input parameters, illustrative examples, algorithms, error messages, and user codes. The LAS source code is so distributed as to simplify system maintenance; the Transportable Application Executive is employed as the user interface, thereby accommodating both expert and novice users by means of menus and tutored prompting. O.C.

A88-15851*# National Aeronautics and Space Administration, Washington, DC.
SPACE STATION INFORMATION SYSTEM - CONCEPTS AND INTERNATIONAL ISSUES
R. B. WILLIAMS, DAVID PRUETT, and DANA L. HALL (NASA, Space Station Program Office, Washington, DC) IAF, International Astronautical Congress, 38th, Brighton, England, Oct. 10-17, 1987. 10 p. refs
(IAF PAPER 87-76) Copyright

The Space Station Information System (SSIS) is outlined in terms of its functions and probable physical facilities. The SSIS includes flight element systems as well as existing and planned institutional systems such as the NASA Communications System, the Tracking and Data Relay Satellite System, and the data and communications networks of the international partners. The SSIS strives to provide both a 'user friendly' environment and a software environment which will allow for software transportability and interoperability across the SSIS. International considerations are discussed as well as project management, software commonality, data communications standards, data security, documentation commonality, transaction management, data flow cross support, and key technologies. K.K.

A88-15906*# National Aeronautics and Space Administration, Washington, DC.
A PROPOSED APPLICATIONS INFORMATION SYSTEM - CONCEPT, IMPLEMENTATION, AND GROWTH
DUDLEY G. MCCONNELL (NASA, Office of Space Science and Applications, Washington, DC), CARROLL A. HOOD, and M. KRISTINE BUTERA (Science Applications International Corp., Washington, DC) IAF, International Astronautical Congress, 38th, Brighton, England, Oct. 10-17, 1987. 10 p. refs
(IAF PAPER 87-156) Copyright

This paper describes a newly developed concept within NASA for an Applications Information System (AIS). The AIS would provide the opportunity to the public and private sectors of shared participation in a remote sensing research program directed to a particular set of land-use or environmental problems. Towards this end, the AIS would offer the technological framework and information system resources to overcome many of the deficiencies that end-users have faced over the years such as limited access to data, delay in data delivery, and a limited access to data reduction algorithms and models to convert data to geophysical measurements. In addition, the AIS will take advantage of NASA developments in networking among information systems and use of state of the art technology, such as CD Roms and optical disks for the purpose of increasing the scientific benefits of applied environmental research. The rationale for the establishment of an AIS, a methodology for a step-wise, modular implementation, and the relationship of the AIS to other NASA information systems are discussed. Author

A88-38690* Jet Propulsion Lab., California Inst. of Tech., Pasadena.
SATELLITE DATA MANAGEMENT FOR EFFECTIVE DATA ACCESS
PATRICK D. HOGAN and THOMAS L. KOTLAREK (California Institute of Technology, Jet Propulsion Laboratory, Pasadena) IN: International Conference on Data Engineering, 3rd, Los Angeles, CA, Feb. 3-5, 1987, Proceedings. Washington, DC, IEEE Computer Society Press, 1987, p. 494-500.
Copyright

The management of data generated from satellite missions has not always led to effective access of that data by the scientific community. NASA has tried to alleviate this problem for ocean scientists, by initiating a program, the NASA Ocean Data System (NODS). The menu-based user interface that NODS employs allows a user to make request and receive answers within a short time of accessing the system. A catalog system, which holds information about oceanographic data sets may be queried to determine the suitability of a particular data set. Once a candidate data set is found, the user is directed to the person or place which actually holds the data. NODS also has an archive system that holds data from ocean-observing satellites. The archive may be queried to obtain a manageable data subset that can be delivered in a useful form. Author

A89-10945#
THE POTENTIALS AND CHALLENGES AFFORDED BY SPOT-1 DATA
THOMAS M. LILLESAND (Wisconsin, University, Madison) IN: International Symposium on Remote Sensing of Environment, 21st, Ann Arbor, MI, Oct. 26-30, 1987, Proceedings. Volume 1. Ann Arbor, MI, Environmental Research Institute of Michigan, 1987, p. 307-316. Research supported by the University of Wisconsin and William and Flora Hewlett Foundation. refs

A program to assess the utility of SPOT-1 data for natural resource applications is examined. Images of Madison, Green Bay, and Spooner, Wisconsin were analyzed to assess the use of SPOT data for generalized land-cover mapping, preparing large-scale image maps, forest classification, and water-quality analysis. Preliminary results of the analysis are presented. Two data-processing procedures are discussed: the digital merger of SPOT 10-m panchromatic and 20-m multispectral data using intensity-hue-saturation color-space transformations, and the development of a semiautomated training-sample selector designed to reduce image-analysis times in multispectral-image classification efforts. It is found that SPOT-1 data are useful across a broad range of natural-resource applications. R.B.

A89-10968#
APPLICATIONS OF MULTISPECTRAL VIDEO FOR NATURAL RESOURCE ASSESSMENT
J. H. EVERITT, D. E. ESCOBAR, and P. R. NIXON (USDA, Agricultural Research Service, Weslaco, TX) IN: International Symposium on Remote Sensing of Environment, 21st, Ann Arbor, MI, Oct. 26-30, 1987, Proceedings. Volume 1. Ann Arbor, MI, Environmental Research Institute of Michigan, 1987, p. 597-618. refs

The development and the application of video imaging systems for natural resource assessment by the USDA, Weslaco, Texas are discussed. Special attention is given to three video systems: a multispectral black-and-white four-band system with visible/NIR sensitivity, a multispectral false-color system that acquires selectable three-band color composite imagery generated by an encoder and its black-and-white narrowband image components, and a black-and-white monoband system with mid-IR sensitivity. It is shown that the near-real-time imagery provided by these systems can be used to detect differences among many agricultural and rangeland resource variables such as plant species, cotton-root rot infestations, soil variations, phytomass levels, burned areas, and ant mounds. I.S.

A89-11809
EXPERIMENTS WITH TEMPORAL REASONING APPLIED TO ANALYSIS OF TELEMETRY DATA
W. A. PERKINS and A. AUSTIN (Lockheed Artificial Intelligence Center, Palo Alto, CA) IN: Space Station automation III; Proceedings of the Meeting, Cambridge, MA, Nov. 2-4, 1987. Bellingham, WA, Society of Photo-Optical Instrumentation Engineers, 1987, p. 39-46. refs
Copyright

A temporal reasoning capability was implemented in a generic expert system shell to increase the flexibility of knowledge representation for a variety of applications. Telemetry data were monitored via satellite (the Space Telescope), and use was made of the rotor controlled electronics bearing having such attributes as actual temperature of the bearing, wheel speed, and motor current. The use of time tags associated with attribute values makes it possible to diagnose different problems occurring at different times with the same component. K.K.

A89-12863
A SYSTEM FOR MANAGEMENT, DISPLAY AND ANALYSIS OF OCEANOGRAPHIC TIME SERIES AND HYDROGRAPHIC DATA
N. N. SOREIDE and S. P. HAYES (NOAA, Pacific Marine Environmental Laboratory, Seattle, WA) IN: Conference on Satellite Meteorology and Oceanography, 3rd, Anaheim, CA, Feb. 1-5, 1988, Preprints. Boston, MA, American Meteorological Society, 1988, p. J20-J22.
Copyright

The paper presents the design criteria and system overview of EPIC, a system developed for the management, display, and analysis of oceanographic time series and hydrographic data collected as part of NOAA's climate research programs (e.g., EPOCS and TOGA). The system incorporates an easy-to-use, interactive user interface with sophisticated data management techniques, an efficient data file format, a suite of analysis and display programs, and procedures for maintaining and updating the data base. B.J.

A89-27851
LOCAL RESOURCE UTILIZATION AND INTEGRATION INTO ADVANCED MISSION'S LSS
FEROLYN T. POWEL (Life Systems, Inc., Cleveland, OH) SAE, Intersociety Conference on Environmental Systems, 18th, San Francisco, CA, July 11-13, 1988. 10 p. refs
(SAE PAPER 881053) Copyright

Key design drivers of the Life Support System (LSS) of advanced manned space missions are duration, distance from earth and cost. All drive the LSS design toward the elimination of expendables and resupply requirements (from earth). Local resource utilization will be required to completely eliminate resupply requirements from earth. Also, in some instances, it may be advantageous to utilize local resources instead of regenerative technologies. This paper provides an introduction and overview to local resource utilization related to the LSS of advanced missions. Author

A89-28460#
SOFTWARE ASPECTS OF EARTH OBSERVATION
C. WAYNE SEBERA (Ford Aerospace Corp., San Jose, CA) and ALLAN JAWORSKI (Ford Aerospace Corp., Seabrook, MD) AIAA, Aerospace Sciences Meeting, 27th, Reno, NV, Jan. 9-12, 1989. 9 p. refs
(AIAA PAPER 89-0779) Copyright

The Earth Observation Systems planned for 1990 through 2015 confronts software developers with significant challenges. Evolving from systems of earlier decades these new design concepts are no longer single spacecraft with ground station, but rather are constellations of multiple satellites and networked ground stations of hundreds of installations. Additionally, sensors will continue to grow more sophisticated, and scientific progress will involve combinations of data fused from diverse temporal, spatial and spectral sources. The software aspects for these new systems are more challenging than ever before. Changes are needed in software development strategies, in providing more capable tools, and in establishing more effective standards if economic factors are to be contained. Author

A89-31939
THE EOS DATA AND INFORMATION SYSTEM - CONCEPTS FOR DESIGN
JOHN A. DUTTON (Pennsylvania State University, University Park) IEEE Transactions on Geoscience and Remote Sensing (ISSN 0196-2892), vol. 27, March 1989, p. 109-116. refs
Copyright

A functional architecture for the earth observation system (EOS) is presented and a variety of management issues are surveyed,

including longevity, coordination with agencies, scientific programs, and other nations, incorporation of existing data, and the importance of effective and responsible scientific governance by the users. The author concludes that, to meet its objectives, the system must facilitate the development of abstract higher-level data structures and data manipulation languages. If that occurs, it is possible that the EOS data and information system will stimulate novel and more powerful modes of thought about the information that portrays the evolution of the earth system. I.E.

A89-31941* Colorado Univ., Boulder.
TOWARD A COMPLETE EOS DATA AND INFORMATION SYSTEM
ROBERT R. P. CHASE (Colorado, University, Boulder) IEEE Transactions on Geoscience and Remote Sensing (ISSN 0196-2892), vol. 27, March 1989, p. 125-131. refs
(Contract NAGW-946; NAGW-1121; NAGW-1191)
Copyright

Based on NASA EOS data panel analyses, an architectural concept is described in terms of elemental composition, top-level functions, and external and internal interfaces. This concept has been evaluated through the use of realistic user-generated scenarios consistent with existing plans for the 1990s and the Space Station. Developmental approaches for the requisite EOS data and information system are presented and a hybrid methodology for implementing this system is discussed. I.E.

A89-41152
CONCEPT FOR A SATELLITE-BASED GLOBAL RESERVE MONITORING SYSTEM
DIANA L. MOSSMAN, RALPH W. KIEFER, and BECKY J. BROWN (Wisconsin, University, Madison) IN: 1988 ACSM-ASPRS Annual Convention, Saint Louis, MO, Mar. 13-18, 1988, Technical Papers. Volume 4. Falls Church, VA, American Congress on Surveying and Mapping and American Society for Photogrammetry and Remote Sensing, 1988, p. 1-10. refs
Copyright

A prototype system is being designed to monitor nature reserves on a global basis using satellite data. This system will have both a central global monitoring facility and a microcomputer-based system that could be used at reserve headquarters for local reserve monitoring. The central system data handling will include monitoring through digital image interpretation. K.K.

A89-41157
USE OF A GEOGRAPHIC INFORMATION SYSTEM (GIS) TO IMPROVE PLANNING FOR AND CONTROL OF THE PLACEMENT OF DREDGED MATERIAL
CYNTHIA A. ABRAHAMSON, ANDREW J. BRUZEWICZ (U.S. Army, Corps of Engineers, Rock Island, IL), and MARK O. JOHNSON (U.S. Army, Construction Engineering Research Laboratory, Champaign, IL) IN: 1988 ACSM-ASPRS Annual Convention, Saint Louis, MO, Mar. 13-18, 1988, Technical Papers. Volume 4. Falls Church, VA, American Congress on Surveying and Mapping and American Society for Photogrammetry and Remote Sensing, 1988, p. 60-68.
Copyright

The use of spatial data and a data base management system to plan for the disposal of dredged material has been studied. The geographic resources data analysis support system (GRASS) software developed at the U.S. Army Construction Engineering Research Laboratory was used on a digital data base developed for the Keithsburg lower dredge cut located 20 miles north of Burlington, Iowa, on the Mississippi River. The use of a National High Altitude Program (NHAP) color IR aerial photograph transparency was digitized with 5- by 5-meter pixels and rectified for use as a base map. K.K.

A89-49447#
DIGITAL MOCKUP
MICHAEL A. RICH (Boeing Commercial Airplanes, Seattle, WA) AIAA, AHS, and ASEE, Aircraft Design, Systems and Operations Conference, Seattle, WA, July 31-Aug. 2, 1989. 6 p.
(AIAA PAPER 89-2086) Copyright

The basic mock-up functions of the engineering design and verification for a commercial aircraft, the manufacturing support, and the control of mockup data are discussed together with methods for a digital mockup. It is shown that the use of digital mock-ups can eliminate the need of physical mock-ups on sections of the aircraft. Based on results from several small-scale digital mock-up activities, it is shown that significant cost savings can be achieved by reducing the flow time during the integrated design/build process. The inaccuracies of the CATIA CAD/CAM system's modeling capabilities for complex parts are demonstrated and the need for model-construction standards is emphasized. I.S.

N84-16078# Army Construction Engineering Research Lab., Champaign, IL.
AN INTERACTIVE SOILS INFORMATION SYSTEM. USERS MANUAL Final Report
W. D. GORAN Sep. 1983 29 p
(AD-A133480; CERL-TR-N-163) Avail: NTIS HCA03/MFA01 CSCL 05/2

This report describes and provides basic instructions for using the Soils Information Retrieval System (SIRS), which was designed for efficient retrieval, analysis, and use of soils data from the U.S. Department of Agriculture's Soil Conservation Service (SCS). SIRS is an experimental subsystem of the Environmental Technical Information System which was developed by the U.S. Army Construction Engineering Research Laboratory and contains a number of computer-based information systems for use in environmental planning and management SIRS provides the user with data compiled by SCS from various soil series throughout the United States. As new information is obtained, the data is updated and inserted in SIRS. This report provides information on how to access and use SIRS, describes the type of data provided by each of the three components of SIRS, and describes the various system commands. Author (GRA)

N84-18112# Washington Univ., Seattle.
SCIENTIFIC AND TECHNICAL INFORMATION SYSTEM FOR THE WASHINGTON STATE LEGISLATURE
L. MEYER May 1983 11 p refs
(Contract NSF ISP-80-19579)
(PB84-100650; NSF/ISP-83016) Avail: NTIS HC A03/MF A01 CSCL 05/2

A scientific and technical information system is suggested for implementation by the Washington State legislature. The system would use legislative staff to process scientific and technical information in a regular, controlled, and organized manner, and would provide legislators with only the scientific and technical information they need. The system has three major components: (1) identification of scientific and technical components of public issues and the relevant sources of information and expertise; (2) mobilization of scientific and technical resources so that questions can be assimilated and responses issued systematically; and (3) communication of issues, advice, information, and analyses from the scientific and technical resource base to legislators. GRA

N84-19174# Air Force Inst. of Tech., Wright-Patterson AFB, OH. Foreign Technology Div.
THE AUTOMATED INFORMATION RETRIEVAL SYSTEM IN THE FIELD OF SCIENCE AND SCIENCE POLICY--AWION
B. KRYGIER 9 Nov. 1983 26 p Transl. into ENGLISH from Zagadnienia Inform. Nauk. (Poland), no. 2(29), 1976 p 61-79
(AD-A135565; FTD-ID(RS)T-1527-83) Avail: NTIS HC A03/MF A01 CSCL 05/2

The scope (subject), task, and function of Poland's automated information system for science (AWION) are characterized. Topics covered include the information source for the system and set organization; the science and science policy thesaurus; the general basis of data processing; conditions for functioning of the AWION system; and the linking of AWION with domestic and foreign information systems in the field of social sciences. Author

N84-21412*# Maryland Univ., College Park. Dept. of Computer Science.
METHOD FOR ACCESSING DISTRIBUTED HETEROGENEOUS DATABASES
B. E. JACOBS *In* NASA, Washington NASA Admin. Data Base Management Systems, 1983 p 89-104 Apr. 1984
Avail: NTIS HC A08/MF A01 CSCL 05/2

A scenario of relational, hierarchial, and network data bases is presented and a distributed access view integrated data base system (DAVID) is described for uniformly accessing data bases which are heterogeneous and physically distributed. The DAVID system is based on data base logic so that the relational approach is generalized to the heterogeneous approach. The global data manager is explained as are global data manipulation languages which can operate on all the data bases and can query the data dictionary and the data directory. A.R.H.

N84-22211*# Boeing Computer Services Co., Seattle, WA.
MANAGING GEOMETRIC INFORMATION WITH A DATA BASE MANAGEMENT SYSTEM
R. P. DUBE *In* NASA. Langley Research Center Computer-Aided Geometry Modeling p 241-254 Mar. 1984 refs
Avail: NTIS HC A17/MF A03 CSCL 09/2

The strategies for managing computer based geometry are described. The computer model of geometry is the basis for communication, manipulation, and analysis of shape information. The research on integrated programs for aerospace-vehicle design (IPAD) focuses on the use of data base management system (DBMS) technology to manage engineering/manufacturing data. The objectives of IPAD is to develop a computer based engineering complex which automates the storage, management, protection, and retrieval of engineering data. In particular, this facility must manage geometry information as well as associated data. The approach taken on the IPAD project to achieve this objective is discussed. Geometry management in current systems and the approach taken in the early IPAD prototypes are examined.
E.A.K.

N84-22402*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
OPTICAL INFORMATION PROCESSING FOR AEROSPACE APPLICATIONS 2
R. L. STERMER, comp. Washington Mar. 1984 261 p refs Conf. held in Hampton, Va., 30-31 Aug. 1983
(NASA-CP-2302; L-15754; NAS 1.55:2302) Avail: NTIS HC A12/MF A02 CSCL 20/6

Current research in optical processing, and determination of its role in future aerospace systems was reviewed. It is shown that optical processing offers significant potential for aircraft and spacecraft control, pattern recognition, and robotics. It is demonstrated that the development of optical devices and components can be implemented in practical aerospace configurations.

N84-23295# Air Force Space Div., Los Angeles, CA.
THE MICROCOMPUTER IN THE ACQUISITION ENVIRONMENT Final Report
M. ECUNG *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 5-11 1983
(AD-P002748) Avail: NTIS HC A24/MF A04 CSCL 15/5

Headquarters Space Division in Los Angeles took the initiative in adopting the microcomputer as a viable tool to improve overall operations. After a little better than 18 months there are over 200 terminals on station. Most are split between 4 and 8 user multiprocessor systems. Our primary goal in both microcomputer hardware and software acquisition is to stay away from proprietary products that can lock the user into a particular vendor for systems support and modification. The result of our November 1981 design decision was hardware configured around the Z80 microprocessor using the S-100 (IEEE-696) Bus. Standardized user interface was included by specifying a keyboard configuration of NASA'S Jet propulsion Laboratory design with 40 programmable function keys. Eight inch single side, single density floppy disk drives (IBM format 3740) were chosen because they represent the one industry wide standard in disk formating. Though most of this work was done in a Contracting office the conclusions are relevant to all. We feel the experience of our period of experimentation with Office Automation can aid other offices considering taking this course of action. We have had both positive and negative result with our effort, but the overall conclusion is that: (1) micro-computer office automation can not be avoided; and (2) we have only scratched the surface of its applications in the acquisition environment.
Author (GRA)

N84-23298# Air Force Systems Command, Wright-Patterson AFB, OH.
THE ACQUISITION MANAGEMENT INFORMATION SYSTEM: FRIEND OR FOE? Final Report
C. R. COOK *In* AF Business Research Management Center Proc. of the Fed. Acquisition Res. Symp. with Theme p 23-27 1983
(AD-P002751) Avail: NTIS HC A24/MF A04 CSCL 15/5

AFSC's Acquisition Management Information System (AMIS) is a complex, extensive computer system containing detailed information on over 61,000 contracts. This paper describes the history and development of AMIS, plus recent actions taken by the Directorate of Contract Data Systems to improve system user-friendliness. A survey of field activities revealed several unsatisfied user needs, especially in data input/output. The Distributed Processing for Contractural Input (DPCI) system was designed and programmed to fill some of these needs. The genesis and growth of DPCI is treated, including software design and hardware acquisition. The paper also covers a fundamental change in management philosophy--expanded participation of system users in establishing and prioritizing system development and change. A new AMIS Users Group was established to advance the effective use of AMIS through the interchange of information concerning system design, use, operation and maintenance. More emphasis is also being placed on improving data base accuracy and completeness. Management education has been stressed. The paper explains steps taken in these and other areas and comments on future system changes to further enhance user-friendliness.
Author (GRA)

N84-24501# Southwest Texas State Univ., San Marcos.
PROJECT FIRST (FACULTY INFORMATION AND RESEARCH SERVICE FOR TEXAS) TECHNICAL DESCRIPTION OF PROJECT AND RESULTS
S. GROGGAN 1983 9 p
(Contract NSF ISP-79-16510)
(PB84-161629; NSF/ISP-83025) Avail: NTIS HC A02/MF A01 CSCL 05/2

The background and objectives of the Faculty Information and Research Service for Texas (FIRST) are presented. The FIRST network consists of campus liaisons located at participating institutions of higher education in Texas. This network functions as an inquiry/response system designed to provide legislators with information quickly, in a readily usable format, and upon request. FIRST is composed of an advisory committee, a director, and an assistant. GRA

N84-26468*# National Aeronautics and Space Administration, Washington, DC.
THE PILOT LAND DATA SYSTEM: REPORT OF THE PROGRAM PLANNING WORKSHOPS
Jul. 1984 167 p refs
(NASA-TM-86250; NAS 1.15:86250) Avail: NTIS HC A08/MF A01 CSCL 05/2

An advisory report to be used by NASA in developing a program plan for a Pilot Land Data System (PLDS) was developed. The purpose of the PLDS is to improve the ability of NASA and NASA sponsored researchers to conduct land-related research. The goal of the planning workshops was to provide and coordinate planning and concept development between the land related science and computer science disciplines, to discuss the architecture of the PLDs, requirements for information science technology, and system

evaluation. The findings and recommendations of the Working Group are presented. The pilot program establishes a limited scale distributed information system to explore scientific, technical, and management approaches to satisfying the needs of the land science community. The PLDS paves the way for a land data system to improve data access, processing, transfer, and analysis, which land sciences information synthesis occurs on a scale not previously permitted because of limits to data assembly and access. E.A.K.

N84-28451# Defense Technical Information Center, San Diego, CA. MATRIS Office.
PROTOTYPE DEVELOPMENT OF AN INFORMATION-SHARING AND DECISION SUPPORT SYSTEM FOR THE MANPOWER PERSONNEL AND TRAINING COMMUNITY
J. OXMAN, L. RICHARDS, and L. LOUGHNANE *In* AF Academy Proc. of the 9th Symp. on Psychol. in the DOD p 371-375 Apr. 1984
(AD-P003310) Avail: NTIS HC A99/MF E06 CSCL 05/1

The availability of up-to-date and reliable data on the substance and funding of Research and Development efforts within the Manpower Personnel and Training (MPT) community, and the valid linkage of such data through a systems approach, are important aids to researchers and managers in the Department of Defense. The Manpower and Training Research Information System (MATRIS) is a computerized, information-sharing and Decision Support System (DSS) designed to provide such aids to those involved with the conduct and/or fiscal management of Department-of-Defense-sponsored, people-related Research and Development pursuits. Although already in operation, the evolution of MATRIS continues within the framework of the prototype development model. The prototype development process of MATRIS, the structure and content of its data base, and the services and products which the system makes possible, are described. Author (GRA)

N84-31741*# California Univ., Santa Barbara. Remote Sensing Research Unit.
NASA PILOT LAND DATA SYSTEM
J. E. ESTES, J. L. STAR, Principal Investigators, and J. FRANKLIN *In its* Activities of the Remote Sensing Inform. Sci. Res. Group 6 p 1 May 1984 ERTS
Avail: NTIS HC A07/MF A01 CSCL 05/2

Project development and planning for a Pilot Land Data System (PLDS) are discussed. The PLDS supplies basic information, data management, and data processing capabilities to the land research community. Topics on design and implementation, user requirements, and project management are examined. The scenarios developed thusfar are also included. M.A.C.

N84-33060# Applied Modeling, Inc., Woodland Hills, CA.
DESIGN, TEST, AND EVALUATION OF AN AIR FORCE ENVIRONMENTAL MODEL AND DATA EXCHANGE Final Report, Sep. 1982 - Sep. 1983
M. R. ALBERTSON and K. T. TRAN Tyndal AFB, Fla. AF Engineering and Services Lab. Apr. 1984 29 p
(Contract F41689-82-C-0068)
(AD-A143226; AFESC/ESL-TR-84-14) Avail: NTIS HC A03/MF A01 CSCL 09/2

This report documents development of a prototype computer system designed to assist environmental quality staff at an Air Force major command. The computer system, an integration of current technology, permits error detection and high-speed processing for modeling, simulation studies, and network operations. Functionally designed to meet novice user requirements, the multiuser system can be inexpensively expanded to accommodate larger workloads. The capabilities of the prototype system meet data base access and extraction requirements for capture and subsequent manipulation of information and environmental quality data needed to perform environmental assessments. The prototype can serve as a test bed for lead-in applications, locally defined processing, and network operations. Author (GRA)

N84-33099# Lawrence Livermore National Lab., CA. Technology Information System.
AN ONLINE DIRECTORY OF DATABASES FOR MATERIAL PROPERTIES
V. E. HAMPEL, W. A. BOLLINGER, C. A. GAYNOR (Control Data Corp.), and J. J. OLDANI May 1984 122 p refs Presented at the 9th Intern. CODATA Conf., Jerusalem, 24-28 Jun. 1984
(Contract W-7405-ENG-48)
(DE84-013210; UCRL-90276; CONF-8406139-1) Avail: NTIS HC A06/MF A01

An online directory of databases of material properties on the Technology Information System at Lawrence Livermore National Laboratory (LLNL/TIS) is described. This directory is intended to provide interactive access to scientific and technical databases available to the public that contain information pertaining to nuclear, atomic, molecular, physical, chemical, and mechanical properties of substances. In addition to the 101 data files previously are reported. The information is updated with more than 38 numeric databases and predictive systems in these fields. In addition to describing the contents of the databases, updated information is provided on the availability of the databases and their online access over public telephone and data networks. Some of the numeric databases are directly accessible by authorized users via the TIS Intelligent Gateway Processor at LLNL (TIS/IGP), with self-guiding procedures for the downloading, merging, post-processing, and graphical/statistical analysis of data. DOE

N84-33279*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
NASA METROLOGY INFORMATION SYSTEM: A NEMS SUBSYSTEM
E. S. GERMAN, JR., F. A. KERN, R. P. YOW (Planning Research Corp.), and E. PETERSON (Planning Research Corp.) *In* NASA, Washington NASA Admin. Data Base Management Systems, 1984 p 89-112 Sep. 1984
Avail: NTIS HC A07/MF A01 CSCL 05/2

the NASA Metrology Information Systems (NMIS) is being developed as a standardized tool in managing the NASA field Center's instrument calibration programs. This system, as defined by the NASA Metrology and Calibration Workshop, will function as a subsystem of the newly developed NASA Equipment Management System (NEMS). The Metrology Information System is designed to utilize and update applicable NEMS data fields for controlled property and to function as a stand alone system for noncontrolled property. The NMIS provides automatic instrument calibration recall control, instrument historical performance data storage and analysis, calibration and repair labor and parts cost data, and instrument user and location data. Nineteen standardized reports were developed to analyze calibration system operations. R.J.F.

N84-33295*# National Academy of Sciences - National Research Council, Washington, DC. Joint Data Panel.
SOLAR-TERRESTRIAL DATA ACCESS DISTRIBUTION AND ARCHIVING Final Report
Feb. 1984 43 p refs Sponsored in part by NOAA and the US Air Force
(NASA-CR-173906; NAS 1.26:173906; PB84-195361) Avail: NTIS HC A03/MF A01 CSCL 05/2

It is recommended that a central data catalog and data access network (CDC/DAN) for solar-terrestrial research be established, initially as a NASA pilot program. The system is envisioned to be flexible and to evolve as funds permit, starting from a catalog to an access network for high-resolution data. The report describes the various functional requirements for the CDC/DAN, but does not specify the hardware and software architectures as these are constantly evolving. The importance of a steering committee, working with the CDC/DAN organization, to provide scientific guidelines for the data catalog and for data storage, access, and distribution is also stressed. GRA

N84-34319# Committee on Science and Technology (U.S. House).
THE ROLE OF INFORMATION TECHNOLOGY IN EMERGENCY MANAGEMENT
Washington GPO 1984 159 p Hearings before the Subcomm. on Invest. and Oversight of the Comm. on Sci. and Technol., 98th Congr., 1st Sess., No. 63, 16-17 Nov. 1983
(GPO-29-457) Avail: Subcommittee on Investigations and Oversight

The ability of the government to anticipate and respond to emergencies (crises) is assessed with emphasis on the adequacy of existing warning systems, ability to predict emergies, response time, and sufficiency of current technology. The Federal Emergency Management Agency (FEMA) is described and pertinent issues are discussed, including: The cooperative use of information technology by governmental agencies and the private sector; the value of simulating emergency situations; establishment and utilization of analyst work stations; the current effectiveness of emergency operation centers; and other public policy issues.
S.B.

N84-34376*# National Aeronautics and Space Administration, Washington, DC.
PLANETARY DATA WORKSHOP, PART 2
Oct. 1984 133 p Workshop held in Greenbelt, Md., 29 Nov. - 1 Dec. 1983 2 Vol.
(NASA-CP-2343-PT-2; NAS 1.55:2343-PT-2) Avail: NTIS HC A07/MF A01 CSCL 03/2

Technical aspects of the Planetary Data System (PDS) are addressed. Methods and tools for maintaining and accessing large, complex sets of data are discussed. The specific software and applications needed for processing imaging and non-imaging science data are reviewed. The need for specific software that provides users with information on the location and geometry of scientific observations is discussed. Computer networks and user interface to the PDS are covered along with Computer hardware available to this data system.

N84-34377*# National Aeronautics and Space Administration, Washington, DC.
DATABASE MANAGEMENT
In its Planetary Data Workshop, Pt. 2 p 148-166 Oct. 1984
Avail: NTIS HC A07/MF A01 CSCL 03/2

Management of the data within a planetary data system (PDS) is addressed. Principles of modern data management are described and several large NASA scientific data base systems are examined. Data management in PDS is outlined and the major data management issues are introduced. R.S.F.

N85-12434# Institute of Oceanographic Sciences, Birkenhead (England). Marine Information and Advisory Service.
INTERNATIONAL BANKING OF SATELLITE AND IN-SITU WAVE DATA BY THE MARINE INFORMATION AND ADVISORY SERVICES (MIAS)
M. T. JONES and A. R. TABOR *In* ESA ERS-1 Radar Altimeter Data Prod. p 91-98 Aug. 1984 refs
Avail: NTIS HC A12/MF A02

The role of the Marine Information and Advisory Service in the international cataloguing and banking of instrumentally collected wave data and its function as the Responsible National Oceanographic Data Centre (Waves) designated by the International Oceanographic Data Exchange Working Committee of the Intergovernmental Oceanographic Commission are described. Data holdings, and data banking and retrieval methods are outlined. Aspects of satellite-recorded wave data are examined, and suggestions for the way in which such data should be banked, indexed, and retrieved are proposed. Author (ESA)

N85-12791# International City Management Association, Washington, DC.
DESIGN OF A SCIENTIFIC INFORMATION COLLATION AND DISSEMINATION SYSTEM, VOLUMES 1 THRU 3 Final Technical Report
G. J. HOETMER, A. C. PAUL, and N. CARSON 28 Jun. 1984 203 p
(Contract EMW-C-0877)
(AD-A146002) Avail: NTIS HC A10/MF A02 CSCL 05/2

The purpose of this study is to: (1) determine the scientific and technological information needs of the emergency management community, and (2) explore the options available to the Federal Emergency Management Agency to coordinate or develop a mechanism to provide this information. GRA

N85-12794# World Wildlife Fund, Inc., Washington, DC.
CORPORATE USE OF INFORMATION REGARDING NATURAL RESOURCES AND ENVIRONMENTAL QUALITY
R. E. TRAIN 16 May 1984 100 p refs Sponsored in part by Council on Environmental Quality
(PB84-222736) Avail: NTIS HC A05/MF A01 CSCL 13/2

Findings and recommendations from a one-year study of the corporate use of information regarding natural resources and environmental quality are presented. Personal interviews were conducted with 229 information users at 45 of America's largest corporations, trade associations and private information companies. In addition, 110 information users participated in a written survey. GRA

N85-13677# Hawaii Univ., Honolulu. Inst. of Geophysics.
ARCHIVING AND EXCHANGE OF A COMPUTERIZED MARINE SEISMIC DATABASE: THE ROSE DATA ARCHIVE SYSTEM
S. L. LATRAILLE Dec. 1983 145 p refs
(DE84-901453; HIG-83-3) Avail: NTIS HC A07/MF A01

A central data exchange facility was organized at Hawaii Institute of Geophysics to manage seismic data collected during the Rivera Ocean Seismic Experiment off the western coast of Mexico. Prior to that experiment, wide consultation was made and much effort was expended in the establishment of a uniform, yet flexible, data exchange format. The participating institutions provided their data to the facility where the data were cataloged and distributed. The processes and computer programs used to catalog, store and distribute the ROSE seismic data are described. DOE

N85-24788 George Washington Univ., Washington, DC.
EVALUATING THE APPROPRIATENESS OF MICROCOMPUTERS FOR LITIGATION DOCUMENT MANAGEMENT USING THE ANALYTIC HIERARCHY PROCESS Ph.D. Thesis
H. A. AMIN 1984 229 p
Avail: Univ. Microfilms Order No. DA8428944

Attorneys involved in large cases have availed themselves of mainframe computers for speed and ease in document management. A modifiable evaluative methodology was developed that would enable a small to mid-sized law firm to evaluate whether the microcomputer, as compared to the manual method, could economically and technically manage case-related documents involved in its litigation support efforts. The Analytic Hierarchy Process (AHP) was applied to develop this evaluative methodology. The requirements of a litigation document management system were researched and specifications for the microcomputer and manual methods of necessary document management were developed. Expert Choice, a software package was used for automating the AHP. Data collection was accomplished through a questionnaire sent to size-relevant law firms, interviews with litigation support consultants, and working sessions with selected lawyers. Dissert. Abstr.

N85-28942# Applied Systems Inst., Inc., Washington, DC.
AVIONICS DATA BASE USERS MANUAL Final Report
J. MCGOWAN, D. J. WON, and D. VANETTEN Jan. 1985 117 p
(Contract DTFA01-83-Y-30629)
(AD-A153810; FAA-APO-85-5) Avail: NTIS HC A06/MF A01 CSCL 01/3

This manual describes the uses, structure, and operating procedures-including data retrieval, entry and special functions-for the Avionics Data Base. This data base provides detailed data for

avionics currently available for both air carrier and general aviation aircraft. Specific information contained in the data base includes price, weight, dimensions, manufacture, manufacture's address and telephone number, Technical Standard Order documentation, and ATA Specification 100 data. The Avionics Data Base was created using Microrim's R:Base Series 4000 Data Base Management System on the IBM Personal Computer. It contains three files or relations as they are referred to in this document. These relations are: Avionics - the relation that contains model specifications. Manufact - the relation that contains address and telephone number for the manufacturers. TSOREF - the relation that contains the Technical Standard Order (TSO) title, location, publication date and source document(s) for each TSO. Author (GRA)

N85-30972# Naval Surface Weapons Center, Dahlgren, VA.
SAFEORD: SAFETY OF EXPLOSIVE ORDNANCE DATABANK Final Report
F. J. HANZEL Jul. 1983 12 p
(AD-A154058; NSWC/MP-83-183) Avail: NTIS HC A03/MF A01 CSCL 09/2

The need for a centrally located databank to store and rapidly retrieve safety information pertaining to Naval explosive ordnance, explosive materials, and weapons systems and components in the Fleet and under development is emphasized daily by urgent requests for this type of data. Instant availability of the necessary data can save lives, time, and money and prevent loss of fleet capability. The ability to obtain these data rapidly, accurately, and economically enhances tremendously the operational effectiveness of the fleet Navy Systems Commands. Working under a NAVSEA Safety Division SEATASK, the System Safety Division developed a functional databank in 1969 capable of storing and providing rapid retrieval of naval explosive ordnance safety data. However, vastly increased demands for faster retrieval, greater simplicity of use, and faster rate of endowment resulted in a critical need restructuring SAFEORD. Restructuring of the Safety of Explosive Ordnance Databank (SAFEORD) includes replacement and additions to the hardware and restructuring of the Computer Software Programs. Hardware changes include replacement of the microfiche camera, fiche printer and developer, and fiche reader-printer and the addition of the CYBER 170/720 computer and an on-line computer terminal that provides the capability to retrieve weapon systems environmental safety test data in matrix format. Restructuring of the software provides a capability to retrieve documents by data and/or author. GRA

N85-30973# Naval Postgraduate School, Monterey, CA.
DESIGN AND IMPLEMENTATION OF AN INTELLIGENCE DATABASE M.S. Thesis
J. E. JANG Dec. 1984 104 p
(AD-A154095) Avail: NTIS HC A06/MF A01 CSCL 09/2

This thesis presents the design and implementation of the Intelligence Database system. A database management system must be used in Intelligence System in order to increase end-user productivity, decrease staff effort, enable the work to be done more efficiently, and permit end-user management more authority and responsibility. The semantic data base model was chosen as the method for designing the data base. The SDM is a high-level semantics-based data base description and structuring formalism for data base design and enhances useability of data base system. Using the output of SDM in the Intelligence data base, the records are rearranged in order to fit a relational DBMS. The Intelligence data base is implemented, using the ORACLE relational DBMS. Author (GRA)

N85-34545# California Univ., Davis. Signal and Image Processing Lab.
A MODEL FOR GRAPHICS INTERFACE TOOL DEVELOPMENT
K. I. JOY *In* Canadian Information Processing Society Graphics Interface 1985 p 159-165 1985 refs
Avail: NTIS HC A19/MF A03

A Problem Solving Environment (PSE) is an integrated system that supports the solution of a given problem, or a set of related problems. Paramount in the development of such environments is the design, specification and integration of user interface tools that communicate between the system and the user. The interaction with tool parameters, which in many applications CAD/CAM, Imaging Systems, image Processing, are represented by graphical data. A user-interface tool development system in which both textural and graphical display, and interaction techniques are integrated under a single model which is described allows the user to interact with tool parameters in either graphical or textural modes, and to have the parameters displayed in the manner most relevant to the problem set. E.A.K.

N85-35459# Geological Survey, Alexandria, VA.
FEDERAL MINERAL LAND INFORMATION SYSTEM Abstract Only
R. L. KLECKNER *In its* USGS Res. on Mineral Resources, 1985 p 65-66 1985
Avail: NTIS HC A05/MF A01

The U.S. Geological Survey is developing the Federal Mineral Land Information System (FMLIS), which will allow land managers, policy makers, and others to rapidly retrieve, display, and analyze minerals information on Federal lands at regional, State, and National levels. This capability is being developed in order to input, manipulate, analyze, and output digital data through a geographic information system (GIS). A GIS is a tool for integrating and analyzing spatial data functions with a GIS allow for changes in map scale and projection, data editing, registration and overlay, selection, retrieval, and display of data tabulation of acreages; and measurement of distances. In an interactive environment, the user can rapidly analyze data, examine alteratives, and test hypotheses. Author

N86-16917# Naval Postgraduate School, Monterey, CA.
DESIGN AND IMPLEMENTATION OF A PERSONNEL DATABASE M.S. Thesis
B. BUYUKONER and Y. OZIN Jun. 1985 157 p
(AD-A159388) Avail: NTIS HC A08/MF A01 CSCL 09/2

This thesis deals with the design considerations for a personnel database system. It introduces the important concepts related to the analysis and design phases of a database system. Two types of data models, namely conceptual and implementation models, are described, particularly concentrating on the Semantic Data Model (SDM) for conceptual and the Relational Data Model for implementation. The Semantic Data Model is used to indicate the entities and relationships between those entities for the Personnel Database. After the completion of this process, the SDM design is converted into a corresponding relational database which is implemented using the ORACLE Database Management System. GRA

N86-17222# Sandia National Labs., Albuquerque, NM.
SANDIA COMPUTERIZED SHOCK COMPRESSION BIBLIOGRAPHICAL DATABASE
J. S. WILBECK, C. E. ANDERSON, J. C. HOKANSON, J. R. ASAY, D. E. GRADY, R. A. GRAHAM, and M. E. KIPP 1985 16 p Presented at the EXPLOMET '85 - International Conference on Metallurgical Applications of Shock Wave and High Strain-rate Phenomena, Portland, Oreg., 28 Jul. 1985 Prepared in cooperation with Winzen International, Inc., San Antonio, Tex. and Southwest Research Inst., San Antonio, Tex.
(Contract DE-AC04-76DP-00789)
(DE85-018542; SAND-85-0309C; CONF-850770-10) Avail: NTIS HC A03/MF A01

A searchable and updateable bibliographical database is being developed which will be designed, controlled, and evaluated by working technical experts in the field of shock-compression science. It will emphasize shock-compression properties in the stress region of a few tens of GPa and provide a broad and complete base of bibliographical information on the shock-compression behavior of materials. Through the operation of technical advisors, the database provides authoritative bibliographical and keyword data for use by both the inexperienced and expert user. In its current form, it consists of: (1) a library of journal articles, reports, books, and symposia papers in the areas of shock physics and shock

mechanics; and (2) a computerized database system containing complete bibliographical information, exhaustive keywork descriptions, and author abstracts for each of the documents in the database library. DOE

N86-19263# National Academy of Engineering, Washington, DC.
INFORMATION TECHNOLOGIES AND SOCIAL TRANSFORMATION Final Report
B. R. GUILE 1985 183 p
(PB85-240521; ISBN-0-309-03529-5; LC-85-4830) Copyright Avail: NTIS HC A09/MF A01 CSCL 05/2

Information technologies are perhaps the most aggressive technologies of the current age, generating progress, change, and turbulence in many branches of industry and in the lives of organizations and individuals. The symposium that produced this volume brought scholars of technology and society together with technologists, social scientists, and representatives from the industrial, legal, and public sectors to discuss the interaction of information technology with social institutions. The topics addressed including a review of recent developments and likely futures in information technology, a comparison of information technology to historical developments in other technologies, and discussion of the interaction of information technology with businesses, homes, property rights in information, and various hierarchies of social organization. GRA

N86-22130*# California Inst. of Tech., Pasadena.
ADVANCED TECHNOLOGY UNIT TRAINING AND MANAGEMENT SYSTEM (ATUTMS). USER'S GUIDE Final Report, Jan. 1984 - Jun. 1985
T. ANTCZAK, A. BENSON, and T. IBBOTT 14 Jul. 1985 319 p
(Contract NAS7-918)
(NASA-CR-176643; NAS 1.26:17643; AD-A161002; ARI-RN-85-71) Avail: NTIS HC A14/MF A02 CSCL 05/9

A computer-based management information system was designed to assist unit training at the battalion level. A prototype system was successfully implemented and made operational within a host battalion of the U.S. Army personnel in the use of this system. ATUTMS uses the relational database management system, INGRES, to record information and to produce reports needed for battalion management. INGRES is utilized to store, add, change, and delete data, and to generate reports. The relational database includes the three functional areas of the battalion: Personnel, Training and Logistics. Word processing is accomplished on ATUTMS by using a software program called MUSE. MUSE consists of a powerful text editor, a spelling checker, and the capability to print documents on either a dot-matrix printer or the system letter-quality printer. Useful tools available on the ATUTMS computer system, in addition to the database management system and word processing, are MAIL and PHONE. Using these tools, the user can communicate with other users on-line or send messages to be read later. The ATUTMS hardware is based on a central computer located in the battalion headquarters building. Terminals are distributed throughout the battalion facilities to make them easily available to users. The central computer is a VAX 11/750. GRA

N86-24215# Navy Personnel Research and Development Center, San Diego, CA.
DEVELOPMENT OF A COMPUTER-MANAGED READINESS ASSESSMENT SYSTEM Final Report, Jul. 1982 - Sep. 1984
W. F. THODE and P. G. BULETZA Dec. 1985 55 p
(AD-A162931; NPRDC-TR-86-8) Avail: NTIS HC A04/MF A01 CSCL 05/9

Readiness of operational units, especially Fleet Air Reconnaissance Squadron TWO (VQ-2), is difficult to assess, particularly during operational cycles when the units are fulfilling their missions. This effort was conducted to develop a readiness training assessment system for VQ-2 to provide accurate, timely, and efficient assessments of the operational readiness of aircrew personnel while maintaining the highest possible state of readiness to perform the squadron's mission. The readiness training system for maintaining readiness and training data for VQ-2 aircrew personnel consists of: (1) a matrix for the EP-3E and the EA-3B aircraft of all the events that affect the readiness of the personnel assigned to the 10 crew positions in the EP-3E and the 5 crew positions in the EA-3B for each of the four VQ-2 mission area; (2) a computer-managed system to enter, process, store, and produce the readiness training manual that contains all VQ-2's references on training and readiness. Author (GRA)

N86-24226# Naval Ocean Research and Development Activity, Bay Saint Louis, MS.
THE GEONAMES PROCESSING SYSTEM FUNCTIONAL DESIGN SPECIFICATION. VOLUME 4: ADVANCED SYMBOL PROCESSING Final Report
G. LANGRAN Mar. 1985 45 p
(AD-A161874; NORDA-101) Avail: NTIS HC A03/MF A01 CSCL 09/2

This report describes the Geonames Processing System attributes and serves as a basis for understanding between the user and the developer. The subsystems referred to are: Advanced Symbol Processing, Advanced Type Placement, Geographic Names Data Base, and Automated Alphanumeric Data Entry System. Contents: Introduction-Overview of Geonames Processing System: Advanced Symbol Processing Overview; Word Processing; Data Base Manipulation; Output Processing; Job Management; File Management; Processing Flow: Data Sets; Interfaces to Other Subsystems; Assumptions and Constraints; Performance Requirements; and Hardware Requirements. GRA

N86-24227# American Society for Engineering Education, Washington, DC.
DESIGN OF GRAPHIC DISPLAYS IN COMPUTERIZED SYSTEMS Final Report, 1 Sep. 1984 - 1 Sep. 1985
K. BENNETT 1 Sep. 1985 37 p
(Contract N00014-83-D-0689)
(AD-A161890) Avail: NTIS HC A03/MF A01 CSCL 09/2

The user's mental model of a computerized, perceptual database system was investigated in three experiments. The system consisted of a database of multidimensional sounds, command to search the database, and one of three separate displays (two graphic displays for training, an alpha-numeric display for testing). The graphic displays presented different conceptualizations of the database; training with a different graphic display was predicted to cause the formation of a different mental model of the system. The results of three experiments indicated that users trained with one graphic display identified two-dimensional sounds with significantly lower latency (Experiment 1) than users trained with the second graphic display. For three-dimensional sounds these findings with both displays this interaction disappeared (Experiment 3). The results indicate that display design can influence the user's mental model of a system and that this has implications for performance with the system. Author (GRA)

N86-24572# Allied Bendix Corp., Kansas City, MO.
KEEPING TRACK OF ARCHIVED DRAWINGS: A CASE STUDY
B. C. GAULT Oct. 1985 21 p Presented at the Applicon Users Group Fall Technical Meeting, Boston, Mass., 28 Oct. 1985
(Contract DE-AC04-76DP-00613)
(DE86-003129; BDX-613-3386; CONF-8510207-2) Avail: NTIS HC A03/MF A01

The Drafting Systems organization at Allied Corporation, Bendix Kansas City Division (BKC), is responsible for the creation of computer-readable media used for producing photoplots, phototools, and production traveler illustrations. From 1977 when the organization acquired its first Applicon system, until now, there have been over 50,000 different plots produced. Keeping track of what plot is on what archived tape has become a very tedious and time consuming task. This paper describes a software package using Datatrieve and TDMS running on a VAX 11/750 and how it has solved this problem. DOE

N86-26000# Stanford Univ., CA. Dept. of Medicine and Computer Science.
DATABASES FOR STATISTICS
C. WIEDERHOLD *In its* Data Base Management p 1-12 31 Jul. 1985 refs
Avail: NTIS HC A14/MF A02 CSCL 09/2

The current status of areas where statistics use and database technology interact is summarized. The fields of database and statistics are both in an advanced state of development. However, their interaction is still in a primitive stage. Databases specifically designed for managing data which are subject to statistical analysis are discussed. A number of definitions are included in the context of a discussion of basic data base concepts. Some implementation issues are presented and Specific Data Base Management Systems (DBMS) are mentioned. Author

N86-26245# Oak Ridge National Lab., TN.
CARBON DIOXIDE INFORMATION CENTER FY 1985 Progress Report
M. P. FARRELL Nov. 1985 59 p
(Contract DE-AC05-84OR-21400)
(DE86-004654; ORNL/CDIC-11) Avail: NTIS HC A04/MF A01

The Carbon Dioxide Information Center (CDIC) has eight major functions: (1) distribute DOE and CDIC publications; (2) publish a CO2 document, CDIC communications; (3) respond to information requests; (4) develop a bibliographic information system and provide searching capabilities; (5) identify the CO2 research community and policymakers and provide access to a computerized world directory; (6) evaluate and test computer codes and package the models; (7) compile and evaluate numeric data bases and package the data; and (8) provide networking facilities among other data centers. CDIC progress during FY 1985 in these functions is discussed. DOE

N86-29295*# Pennsylvania State Univ., University Park. Dept. of Meteorology.
UNIVERSITY PARTICIPATION VIA UNIDATA, PART 1
J. DUTTON *In* NASA. Goddard Space Flight Center Proceedings of the Second Pilot Climate Data System Workshop 7 p 1986
Avail: NTIS HC A12/MF A02 CSCL 04/2

The UNIDATA Project is a cooperative university project, operated by the University Corporation for Atmospheric Research (UCAR) with National Science Foundation (NSF) funding, aimed at providing interactive communication and computations to the university community in the atmospheric and oceanic sciences. The initial focus has been on providing access to data for weather analysis and prediction. However, UNIDATA is in the process of expanding and possibly providing access to the Pilot Climate Data System (PCDS) through the UNIDATA system in an effort to develop prototypes for an Earth science information system. The notion of an Earth science information system evolved from discussions within NASA and several advisory committees in anticipation of receiving data from the many Earth observing instruments on the space station complex (Earth Observing System). Author

N86-29296*# University Corp. for Atmospheric Research, Boulder, CO.
UNIVERSITY PARTICIPATION VIA UNIDATA, PART 2
D. W. FULKER *In* NASA. Goddard Space Flight Center Proceedings of the Second Pilot Climate Data System Workshop 3 p 1986
Avail: NTIS HC A12/MF A02 CSCL 04/2

The University Corporation for Atmospheric Research (UCAR) is presently completing UNIDATA, Phase II, considered to be the design phase of the UNIDATA Project. The four major components of the UNIDATA System are: (1) global services which access is provided, (2) long haul communication for providing that access, (3) local services for providing access and local management of acquired data, and (4) local interactive processing and graphical display. Each component is described in detail with linkages among the components elucidated. Within this framework, access to the PCDS is discussed. It is pointed out that access to the PCDS could occur via general purpose computer-to-computer communications providing remote log on to the system. The UNIDATA System could also be used to transfer information from the PCDS, provided the appropriate software is available to receive the data. Both of these scenarios require agreements on the access protocols and appropriate physical connections. Universities' needs for weather information on a near real-time basis, and UNIDATA has already established a satellite broadcast data service for this purpose. Author

N86-32863*# California Univ., Santa Barbara.
REMOTE SENSING INFORMATION SCIENCES RESEARCH GROUP, SANTA BARBARA INFORMATION SCIENCES RESEARCH GROUP, YEAR 3 Final Report
J. E. ESTES, T. SMITH, and J. L. STAR 5 Jan. 1986 87 p
(Contract NAGW-455)
(NASA-CR-179769; NAS 1.26:179769) Avail: NTIS HC A05/MF A01 CSCL 05/2

Research continues to focus on improving the type, quantity, and quality of information which can be derived from remotely sensed data. The focus is on remote sensing and application for the Earth Observing System (Eos) and Space Station, including associated polar and co-orbiting platforms. The remote sensing research activities are being expanded, integrated, and extended into the areas of global science, georeferenced information systems, machine assissted information extraction from image data, and artificial intelligence. The accomplishments in these areas are examined.

N86-32938# World Climate Programme, Geneva (Switzerland).
GUIDELINES ON THE STRUCTURE, MANAGEMENT, AND OPERATION OF CLIMATE DATA CENTERS
1986 74 p Presented at Inter-Commission Meeting on Climate Data Centre Design and Operations, Atmospheric Environment Service, Downsview, Ontario, 29 Oct. - 2 Nov. 1984
(WCP-99; WMO/TD-48; ETN-86-97250) Avail: NTIS MF A01; HC at WMO, Geneva, Switzerland

World Meteorological Organization climate data center functions and structure are outlined. Data collection and communication; data quality control and processing; data base management and structure; data base services and access; and data security are discussed. ESA

N87-11492# Defense Technical Information Center, Alexandria, VA.
AN ASSESSMENT OF CD ROM (COMPACT DISK READ ONLY MEMORY)
K. J. JACOBSON Jun. 1986 13 p
(AD-A169259; DTIC/TR-86/15) Avail: NTIS HC A03/MF A01 CSCL 09/2

Compact Disk Read Only Memory (CD ROM) is one of a group of optical disk that offers great information storage potential. CD ROM Technology uses a laser to burn (record) pits in the light sensitive surface of an optical or plastic coated disk. The typical 4.75 inch CD ROM disk offers enough storage capability to hold the contents of 1,200 standard 5.25 inch floppy disks. This report describes the current state-of-the-art and typical steps in preparing the CD ROM database, including data preparation (data indexing and reformatting), disk premastery, disk mastery, and mass replication. The strengths of CD ROM technology include high data storage density, relatively low costs for widely distributed databases, relatively high random access speeds, and disk durability and integration in the normal office environment. Limitations include the current high costs of premastering and mastering disks, and the lack of standardization among CD ROM producers. CD ROM is not an acceptable storage alternative for databases that are highly volatile, however an erasable optical disk is currently under development. GRA

N87-11493# Oak Ridge National Lab., TN.
DOCUMENTATION OF MATERIALS DATA FOR COMPUTER STORAGE AND RETRIEVAL

M. K. BOOKER 1986 38 p
(Contract DE-AC05-84OR-21400)
(DE86-009509; CONF-860722-11) Avail: NTIS HC A03/MF A01

Paradioxically, the biggest problem with computer data management systems is also the biggest advantage - that such systems allow huge amounts of data to be accessed in a convient fashion. The very mass of data that can be delivered through such systems can result in considerable confusion on the part of the user. A few of the considerations that designers and operators of computerized materials data bases must take into account in order to assure that their data bases are useful and efficient are discussed. In particular, the complex (but vital) problem of documenting and characterizing the data stored in computer data bases in such a fashion as to assure (as far as possible) proper understanding and use of the data by persons accessing the data bases will be examined. B.G.

N87-12388# California Univ., Berkeley. Lawrence Berkeley Lab.
A USER'S GUIDE TO THE SOCIOECONOMIC ENVIRONMENTAL DEMOGRAPHIC INFORMATION SYSTEM (SEEDIS)
F. C. GEY Jan. 1986 130 p
(AD-A168917; IWR-86-UM-1) Avail: NTIS HC A07/MF A01
CSCL 05/3

SEEDIS, the Lawrence Berkeley Laboratory's Socio-Economic Environmental-Demographic Information system, is an integrated information system for retrieving, analyzing, and displaying selected portions of large data bases. These include a wide variety of geographically linked data on the United States' population, economy, agriculture, employment, mortality, air quality, and energy production and use. For Corps of Engineers' planners, SEEDIS is primarily useful for obtaining demographic and socioeconomic data for economic base studies, social profiles and other plan formulation and evaluation tasks. Using SEEDIS Corps analysts can: (1) retrieve over 50,000 pieces of information at county levels of detail and over 1,000 pieces of data for sub-county levels of geography; (2) transform SEEDIS data into formats useable by statistical analysis programs (SPSS and SAS) as well as by popular microcomputer Spreadsheet programs (LOTUS 1-2-3); and (3) download SEEDIS files or transformed files to microcomputer using communications software. This manual guides a new SEEDIS user on a step-by-step tour through the elements of SEEDIS. This journey is illustrated by examples screens, each of which builds upon previous ones. The examples focus on a three county geographic area (the Topeka Kansas SMSA) and on data from the 1947 to 1977 County Data Book and 1980 Census summary tape files. GRA

N87-12404# Wisconsin Univ., Milwaukee. Center for Urban Transportation Studies.
TECHNOLOGY TRANSFER PRIMER Final Report
R. P. SCHMITT, E. A. BEIMBORN, and M. J. MULROY Jul. 1985 64 p Sponsored by Federal Highway Administration
(PB86-205341; FHWA/TS-84/226) Avail: NTIS HC A04/MF A01
CSCL 05/1

A general definition and broad overview of the Technology Transfer (T2) Process is provided from a general point of view. The operative elements which need to be included in a successful T2 process are described. Also, included are generic outlines, guidelines and helpful checklists on verbal communication techniques and the preparation of visual aid materials. Table of Contents: The nature of change; The human element; Principles of communication; Basic communication skills; Written communication; Techniques to help us see; Meetings, workshops, and conferences; Technology transfer in actions; and Evaluations. GRA

N87-18465# Brookhaven National Lab., Upton, NY. Applied Science Dept.
DATA MANAGEMENT OF A MULTILABORATORY FIELD PROGRAM USING DISTRIBUTED PROCESSING
J. L. TICHLER 1986 5 p Presented at the 10th International CODATA Conference, Ottawa, Ontario, 14 Jul. 1986
(Contract DE-AC02-76CH-00016)
(DE86-014770; BNL-38432; CONF-860762-3) Avail: NTIS HC A01/MF A01

The PRECP program is a multilaboratory research effort conducted by the US Department of Energy as a part of the National Acid Precipitation Assessment Program (NAPAP). The primary objective of PRECP is to provide essential information for the quantitative description of chemical wet deposition as a function of air pollution loadings, geograpic location, and atmospheric processing. The program is broken into four closely interrelated sectors: Diagnostic Modeling; Field Measurements; Laboratory Measurements; and Climatological Evaluation. Data management tasks are: compile databases of the data collected in field studies; verify the contents of data sets; make data available to program participants either on-line or by means of computer tapes; perform requested analyses, graphical displays, and data aggregations; provide an index of what data is available; and provide documentation for field programs both as part of the computer database and as data reports. DOE

N87-19845# Battelle Pacific Northwest Lab., Sequim, WA.
DEVELOPMENT OF A MICROMETEOROLOGICAL AND TRACER DATA ARCHIVE Final Report
J. G. DROPPO Oct. 1986 25 p
(Contract EPA-68-02-4063)
(PB87-110490; EPA-600/3-86-053) Avail: NTIS HC A03/MF A01
CSCL 04/2

The aim of this effort was to develop and test a means for archiving invaluable data sets in a timely fashion before the necessary supporting information becomes lost for ever. During the course of the project, a series of reports for the user of the archive were prepared. The final project report documents efforts related to the development and implementation of the archive that were not covered in previous reports. The emphasis in this report is on the activities related to creation of data archive sets. Starting with the selection of a computer and software, and ending with the final quality assurance checks on the archived data, information is presented to provide guidance to those wishing to add additional data sets to the micrometeorological and tracer data archive. GRA

N87-23018*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
QUICK-LOOK GUIDE TO THE CRUSTAL DYNAMICS PROJECT'S DATA INFORMATION SYSTEM
CAREY E. NOLL, JEANNE M. BEHNKE, and HENRY G. LINDER Jun. 1987 82 p
(NASA-TM-87818; NAS 1.15:87818) Avail: NTIS HC A05/MF A01 CSCL 08/7

Described are the contents of the Crustal Dynamics Project Data Information System (DIS) and instructions on the use of this facility. The main purpose of the DIS is to store all geodetic data products acquired by the Project in a central data bank and to maintain information about the archive of all Project-related data. Access and use of the DIS menu-driven system is described as well as procedures for contacting DIS staff and submitting data requests. Author

N87-23312# Sci-Tech Knowledge Systems, Scotia, NY.
MATERIALS INFORMATION FOR SCIENCE AND TECHNOLOGY (MIST). PROJECT OVERVIEW: PHASE 1 AND 2 AND GENERAL CONSIDERATIONS
W. GRATTIDGE, J. WESTBROOK, J. MCCARTHY, C. NORTHRUP, JR., and J. RUMBLE, JR. Nov. 1986 128 p Prepared in cooperation with Lawrence Berkeley Lab., Calif., Sandia National Labs., Albuquerque, N. Mex., and the National Bureau of Standards, Washington, D.C.
(DE87-006799; NBS-SP-726) Avail: NTIS HC A07/MF A01

The National Bureau of Standards and the Department of Energy have embarked on a program to build a demonstration computerized materials data system called Materials Information for Science and Technology (MIST). This report documents the first two phases of the project. The emphasis of the first phase

was on determining what information was needed and how it could impact user productivity. The second phase data from the Aerospace Metal Handbook on a set of alloys was digitized and incorporated into the system. DOE

N87-28460# Sandia National Labs., Albuquerque, NM.
INFORMATION NETWORK FOR NUMERIC DATABASES OF MATERIALS PROPERTIES
F. C. ALLAN Jun. 1987 14 p Presented at the 78th Annual Conference of the Special Libraries Association, Anaheim, Calif., 6 Jun. 1987
(Contract DE-AC04-76DP-00789)
(DE87-010512; SAND-87-0215C; CONF-8706131-1) Avail: NTIS HC A03

This talk traces the development of a network system for materials properties. It shows what our library has done to be involved. But we have benefitted also. First, there is the sense of being involved in a vital and active process, which has possibilities of developing in various ways. Then there is the feeling that we are contributing to that which we will also be using in the future. In addition, involvement has made us aware of what else has been going on world-wide and the increasing cooperation evolving among all participants. Last, there is the satisfaction from the idea that we are contributing uniquely from our status as a special library. DOE

N87-30211# Brookhaven National Lab., Upton, NY.
DATA INTEGRATION FOR A SCIENTIFIC FIELD EXPERIMENT
C. M. BENKOVITZ May 1987 10 p Presented at the Piecing the Puzzle Together Conference on Integrating Data for Decisionmaking, Washington, D.C., 27 May 1987
(Contract DE-AC02-76CH-00016)
(DE87-011302; BNL-39865; CONF-8705147-1) Avail: NTIS HC A02/MF A01

The Atmospheric Sciences Division at Brookhaven National Laboratory supports several projects involved in the development and application of data management techniques to compile, analyze and distribute scientific data sets that are the result of various multi-institutional experiments and data gathering projects. This paper will describe the data coordination function needed for one such experiment, the Cross Appalachian Tracer Experiment, which took place in September of 1983. The data needed for experiment planning had to be obtained and analyzed; the data produced during the field period by experiment participants had to be integrated with additional data sets produced outside of CAPTEX so that post experiment analyses could be conducted. Problems presented by the integration of diverse data sets flowing from multiple sources can be divided into problems requiring proper people interfacing and problems that can be solved via the use of computerized techniques. The degree of data integration given each CAPTEX data set was governed by its ultimate use and by the share of total resources available for the task. In this paper the solutions adopted for different data sets for both types of problems will be described. The resulting data sets are available to the scientific community at large. DOE

N88-11564# Lawrence Livermore National Lab., CA.
DESIGN AND DEVELOPMENT OF A DATABASE FOR SPECTRAL DATA AND ANALYSIS RESULTS
A. D. DOUGAN, J. B. CARLSON, D. R. MANATT, W. M. BUCKLEY, and R. D. POCHY 15 Apr. 1987 5 p Presented at the Ingres User Association Meeting, San Francisco, Calif., 26 Apr. 1987 Prepared in cooperation with Compuchem, Inc., Hayward, Calif.
(Contract W-7405-ENG-48)
(DE87-011323; UCRL-96378; CONF-8704121-2) Avail: NTIS HC A01/MF A01

A data-management system to provide quick access to spectral data and to track chemical parameters and analysis results has been developed. Data are collected at workstations which control stand-alone pulse height analyzers used for gamma, X-ray or alpha counting. The data is electronically transferred to a VAX computer where it is entered into an INGRES database. A set of tools has been developed to allow users easy access to this database. Intergroup transfer of analyzed results is in the form of transactions, which are modeled after banking transactions. DOE

N88-12086# Naval Postgraduate School, Monterey, CA.
OPTICAL LASER TECHNOLOGY, SPECIFICALLY CD-ROM (COMPACT DISC - READ ONLY MEMORY) AND ITS APPLICATION TO THE STORAGE AND RETRIEVAL OF INFORMATION M.S. Thesis
DAVID J. LIND Jun. 1987 132 p
(AD-A184111) Avail: NTIS HC A07/MF A01 CSCL 09/5

One of the significant problems of this information age is the production of vast amounts of information in a form that is neither convenient nor cost effective. A possible solution to this, is the new optical laser technology and its use in the storage and retrieval of large amounts of information. In many areas of DOD, the greatest benefit would be the regained space and weight associated with the distribution of the manuals and other typically paper products on a Compact Disc - Read Only Memory (CD-ROM). One CD-ROM weighs less than an ounce and is capable of storing over 270,000 pages of text. The saved shipping and handling costs alone would be astronomically reduced not to mention the end user who would have a more effective and efficient product. The CD-ROM is designed to work as a peripheral device to a microcomputer and can therefore be made available to any user within an IBM compatible microcomputer. The application/demonstration portion of this thesis took over 2 million database records, from the Transaction Ledger on Disc (TLOD), at the Naval Supply Center (NSC) in Oakland and pressed them to a single CD-ROM. The menu driven retrieval software with indexing on 3 criteria was also provided. GRA

N88-13085 California Univ., Berkeley.
SUBJECTIVE PROBABILITY, COMBINATION OF EXPERT OPINION AND PROBABILISTIC APPROACHES TO INFORMATION RETRIEVAL Ph.D. Thesis
PAUL THOMPSON 1986 184 p
Avail: Univ. Microfilms Order No. DA8718181

Probability and its application to the problem of information retrieval were studied. A survey and examination of current work on probabilistic indexing, probabilistic queries, and rules for how these can be combined and used in order to rank output documents by computed values of probability of relevance are presented. In these current approaches to probabilitistic information retrieval (PIR), probability is interpreted as a relative frequency or as a person's estimate of a relative frequency. There are three major conceptual difficulties with current theories: independence/dependence of individual term probabilities; the small sample return; and the validity of probabilities used. The psychological literature on human probability assessment was studied. A computerized simulation study examines how errors in estimation of term probabilities propagate into the combined probability for each document and how this affects the ranked output of documents. A mathematical model was developed for PIR which uses a subjective interpretation of probability, probability distributions, and the technique of combination of expert opinions. Dissert. Abstr.

N88-18505# Strategic Air Command, Offutt AFB, NE.
AIR FORCE GEOGRAPHIC INFORMATION AND ANALYSIS SYSTEM
D. A. HENNEY, D. S. JANSING, R. C. DURFEE, S. M. MARGLE, and L. E. TILL 1987 11 p Presented at the Geographic Information System Conference, San Francisco, Calif., 27 Oct. 1987 Prepared in cooperation with Civil Engineering Squadron, Sheppard AFB, Tex. and ORNL, Tenn.
(Contract DE-AC05-84OR-21400)
(DE88-001420; CONF-8710173-1) Avail: NTIS HC A03/MF A01

A microcomputer-based geographic information and analysis system (GIAS) was developed to assist Air Force planners with environmental analysis, natural resources management, and facility and land-use planning. The system processes raster image data, topological data structures, and geometric or vector data similar

to that produced by computer-aided design and drafting (CADD) systems, integrating the data where appropriate. Data types included Landsat imagery, scanned images of base maps, digitized point and chain features, topographic elevation data, United States Geological Survey stream course data, highway networks, railroad networks, and land use/land cover information from United States Geological Survey interpreted aerial photography. The system is also being developed to provide an integrated display and analysis capability with base maps and facility data bases prepared on CADD systems. DOE

N88-29247# Sandia National Labs., Albuquerque, NM.
A COMPARISON OF TYPICAL METEOROLOGICAL YEAR SOLAR RADIATION INFORMATION WITH THE SOLMET DATA BASE
D. F. MENICUCCI and J. P. FERNANDEZ Feb. 1988 406 p
(Contract DE-AC04-76DP-00789)
(DE88-009242; SAND-87-2379) Avail: NTIS HC A18

Over the years the misapplication of TMY and SOLMET data has become increasingly prevalent and, in some cases, has led to improperly sized solar energy systems or incorrect conclusions from research efforts. Much of the misapplication stems from misunderstanding and confusion about the origin, design and originally intended uses of these data. This report outlines the historical development of the SOLMET and TMY data bases and discusses the various appropriate applications for them. A majority of the report is devoted to the presentation of summary solar radiation information about the SOLMET data base and associated TMY data. Solar resource summary statistics are computed for direct normal, total normal, and fixed tilt collectors at thirty-eight sites. For each site, statistical information is presented in graphical and tabular form and can be used to compare the representative TMY year to each SOLMET year. This report is specifically intended for individuals who use TMY and/or SOLMET solar radiation data in some aspect of solar system design, analysis, or operation and want information about the potential yearly variation of the solar resource in various locations throughout the United States. DOE

N89-10500# Air Force Geophysics Lab., Hanscom AFB, MA.
THE REMOTE ATMOSPHERIC PROBING INFORMATION DISPLAY (RAPID) SYSTEM Final Report, Sep. 1986 - Sep. 1987
P. A. SADOSKI, D. EGERTON, F. I. HARRIS (ST Systems Corp., Lexington, Mass.), and A. R. BOHNE 15 Jan. 1988 26 p
(Contract AF PROJ. 6670)
(AD-A196314; AFGL-TR-88-0036; AFGL-ERP-997) Avail: NTIS HC A03/MF A01 CSCL 04/2

The RAPID system has been developed to support short term forecasting of cloud and precipitation. RAPID was developed with the philosophy that the system should be easily maintained, user-friendly, yet powerful enough to perform both the analysis of radar and satellite data and generation of forecasts in real-time. The two major hardware components are a VAX host computer and an ADAGE RDS-3000 image processor. The RAPID user environment is structured to encourage user participation. Numerous standardization procedures are employed: a functional disk organization, standardized data and source file headers, extensive file documentation, and use of user developed RAPID tools, and libraries of often used routines. Data management has been designed to maximize the potential for real time capability. Radar and satellite data are preprocessed on other computers before ingestion into RAPID. The bulk of these data and derived products are stored, and analysis and display are performed entirely within the image processor. GRA

N89-11615# Stanford Linear Accelerator Center, CA.
INTEGRATED DATABASE APPROACH FOR GEODETIC APPLICATIONS
ROBERT RULAND and DETLEV RULAND (Wuerzburg Univ., West Germany.) Nov. 1987 20 p Presented at the 4th International Working Conference on Statistical and Scientific Database Management, Rome, Italy, 21 Jun. 1988
(Contract DE-AC03-76SF-00515)
(DE88-012726; SU-SLAC-PUB-4474; CONF-8806166-2) Avail: NTIS HC A03/MF A01

Geodetic measurements even of a defined project produce a vast amount of heterogeneous data. The analysis of these data used to be time-and-manpower consuming and only focused on subsets of the data. This paper demonstrates how an integrated database system will provide an immediate standardized and easy access to the entire information support data management, and, consequently, streamline the analysis. DOE

N89-12554'# National Aeronautics and Space Administration, Ames Research Center, Moffett Field, CA.
DEVELOPMENT AND VALIDATION OF AN ADVANCED LOW-ORDER PANEL METHOD
DALE L. ASHBY, STEVEN K. IGUCHI (Sterling Federal Systems, Inc., Palo Alto, Calif.), and MICHAEL DUDLEY Oct. 1988 48 p
(NASA-TM-101024; A-88275; NAS 1.15:101024) Avail: NTIS HC A03/MF A01 CSCL 01/1

A low-order potential flow panel code, PMARC, for modeling complex three-dimensional geometries, is currently being developed at NASA Ames Research Center. The PMARC code was derived from a code named VSAERO that was developed for Ames Research Center by Analytical Methods, Inc. In addition to modeling potential flow over three-dimensional geometries, the present version of PMARC includes several advanced features such as an internal flow model, a simple jet wake model, and a time-stepping wake model. Data management within the code was optimized by the use of adjustable size arrays for rapidly changing the size capability of the code, reorganization of the output file and adopting a new plot file format. Preliminary versions of a geometry preprocessor and a geometry/aerodynamic data postprocessor are also available for use with PMARC. Several test cases are discussed to highlight the capabilities of the internal flow model, the jet wake model, and the time-stepping wake model. Author

N89-12558# Federal Aviation Administration, Atlantic City, NJ. Technical Center.
LORAN C OFFSHORE FLIGHT FOLLOWING (LOFF) IN THE GULF OF MEXICO
FRANK LORGE Feb. 1988 68 p
(AD-A197179; DOT/FAA/CT-TN88/8) Avail: NTIS HC A04/MF A01 CSCL 17/7

This report describes results of tests conducted by the FAA Technical Center to evaluate the LOFF system. Simulation and flight test were used to measure system performance under operational conditions. The LOFF system is the first implementation of Automatic Dependent Surveillance (ADS) by the FAA to track aircraft. It uses aircraft derived position as determined by Loran, transmitted by VHF data link for use by air traffic controllers. A converter unit was installed in the Houston Air Route Traffic Control Center (ARTCC) to process incoming LOFF messages and convert them into a radar data format. Results of this conversion are input to the Enhanced Direct Access Radar Channel (EDARC) which presents the aircraft as a conventional radar target. The system provides coverage in areas not currently served by radar, offshore in the Gulf of Mexico. Simulated inputs were used during testing to determine accuracy of the LOFF converter, to measure timing delays, and to relate aircraft position in latitude/longitude to a displayed position as seen by the controller. Flight tests were conducted to determine VHF coverage using the system, to measure Loran accuracy in the area, to compare dynamic performance with nondynamic performance of the EDARC system, and to provide an overall evaluation of the operational system. Overall results of the LOFF test program were favorable. The system performs in a predictable and reasonable manner and is comparable to that of radar. GRA

N89-12581'# Martin Marietta Aerospace, Denver, CO. Space Station Program.
SPACE STATION INTEGRATED PROPULSION AND FLUID SYSTEMS STUDY
L. ROSE, D. BERGMAN, B. BICKNELL, and S. WILSON 25

Aug. 1987 77 p
(Contract NAS8-36438)
(NASA-CR-179393; NAS 1.26:179393; MCR-87-580) Avail: NTIS HC A05/MF A01 CSCL 22/2

This Databook addresses the integration of fluid systems of the Space Station program. It includes a catalog of components required for the Space Station elements fluid systems and information on potential hardware commonality. The components catalog is in four parts. The first part lists the components defined for all the fluid systems identified in EP 2.1, Space Station Program Fluid Systems Configuration Databook. The components are cross-referenced in three sections. Section 2.1 lists the components by the fluid system in which they are used. Section 2.2 lists the components by type. Section 2.3 lists by the type of fluid media handled by the component. The next part of the catalog provides a description of the individual component. This section (2.4) is made up of data retrieved from Martin Marietta Denver Aerospace component data base. The third part is an assessment of propulsion hardware technology requirements. Section 2.5 lists components identified during the study as requiring development prior to flight qualification. Finally, Section 2.6 presents the results of the evaluation of commonality between components. The specific requirements of each component have been reviewed and duplication eliminated. Author

N89-13305# California Univ., Berkeley. Dept. of Computer Sciences.
MULTIPLE REPRESENTATION DOCUMENT DEVELOPMENT
Technical Report, 7 Aug. 1984 - 6 Aug. 1987
PEHONG CHEN and MICHAEL A. HARRISON 6 Aug. 1987 38 p
(Contract N00039-84-C-0089; ARPA ORDER 4871)
(AD-A197369; UCB/CSD-87/367) Avail: NTIS HC A03/MF A01 CSCL 12/5

The world of electronic publishing software seems to divide into two camps: the conventional batch-oriented programming language approach versus the more elaborate direct manipulation paradigm. This paper indicates which aspects of document preparation are more conveniently handled under which model and points out several instances of a hybrid approach which takes advantage of multiple representations. The authors introduce a framework for analyzing the structure of multiple representation systems in general. Based upon this simple but robust framework, a top-down design methodology is derived. The design of a fairly sophisticated document development environment is discussed as a case study of the methodology. GRA

N89-14472*# Lockheed Missiles and Space Co., Palo Alto, CA. Research and Development Div.
THE COMPUTATIONAL STRUCTURAL MECHANICS TESTBED ARCHITECTURE. VOLUME 1: THE LANGUAGE
CARLOS A. FELIPPA Dec. 1988 95 p
(Contract NAS1-18444)
(NASA-CR-178384; NAS 1.26:178384; LMSC/D878511-VOL-1)
Avail: NTIS HC A05/MF A01 CSCL 20/11

This is the first set of five volumes which describe the software architecture for the Computational Structural Mechanics Testbed. Derived from NICE, an integrated software system developed at Lockheed Palo Alto Research Laboratory, the architecture is composed of the command language CLAMP, the command language interpreter CLIP, and the data manager GAL. Volumes 1, 2, and 3 (NASA CR's 178384, 178385, and 178386, respectively) describe CLAMP and CLIP, and the CLIP-processor interface. Volumes 4 and 5 (NASA CR's 178387 and 178388, respectively) describe GAL and its low-level I/O. CLAMP, an acronym for Command Language for Applied Mechanics Processors, is designed to control the flow of execution of processors written for NICE. Volume 1 presents the basic elements of the CLAMP language and is intended for all users. Author

N89-15435*# Lockheed Missiles and Space Co., Palo Alto, CA. Research and Development Div.
THE COMPUTATIONAL STRUCTURAL MECHANICS TESTBED ARCHITECTURE. VOLUME 2: THE INTERFACE
CARLOS A. FELIPPA Dec. 1988 212 p
(Contract NAS1-18444)
(NASA-CR-178386; NAS 1.26:178386; LMSC/D878511-VOL-2)
Avail: NTIS HC A10/MF A02 CSCL 20/11

This is the third set of five volumes which describe the software architecture for the Computational Structural Mechanics Testbed. Derived from NICE, an integrated software system developed at Lockheed Palo Alto Research Laboratory, the architecture is composed of the command language CLAMP, the command language interpreter CLIP, and the data manager GAL. Volumes 1, 2, and 3 (NASA CR's 178384, 178385, and 178386, respectively) describe CLAMP and CLIP and the CLIP-processor interface. Volumes 4 and 5 (NASA CR's 178387 and 178388, respectively) describe GAL and its low-level I/O. CLAMP, an acronym for Command Language for Applied Mechanics Processors, is designed to control the flow of execution of processors written for NICE. Volume 3 describes the CLIP-Processor interface and related topics. It is intended only for processor developers. Author

N89-16016# IIT Research Inst., Bartlesville, OK.
THERMODYNAMICS OF MATERIALS IN THE RANGE 610-616 DATA BASE REFERENCE MANUAL
M. M. STRUBE, D. G. ARCHER, R. B. CHIRICO, and W. V. STEELE Oct. 1988 27 p Prepared for Naval Air Propulsion Center, Trenton, NJ, and Air Force Wright Aeronautical Lab., Wright Patterson AFB, Ohio
(Contract DE-FC22-83FE-60149)
(DE88-001244; NIPER-334) Avail: NTIS HC A03/MF A01

This document is intended to serve as a users guide for the Thermodynamic Properties and Thermodynamic Functions Data Base programs. Installation instructions are given for both data base programs. An overview of the data base structures and contents is then provided. A brief section outlining the special usage of the computer keyboard when accessing the data bases is also given. A guided tour through the data bases is provided with figures illustrating the various information screens and data files seen by the user at each stage. DOE

N89-16195*# Lockheed Missiles and Space Co., Palo Alto, CA. Research and Development Div.
THE COMPUTATIONAL STRUCTURAL MECHANICS TESTBED ARCHITECTURE. VOLUME 4: THE GLOBAL-DATABASE MANAGER GAL-DBM
MARY A. WRIGHT, MARC E. REGELBRUGGE, and CARLOS A. FELIPPA (Colorado Univ., Boulder.) Jan. 1989 208 p
(Contract NAS1-18444)
(NASA-CR-178387; NAS 1.26:178387; LMSC/D878511-VOL-4)
Avail: NTIS HC A10/MF A02 CSCL 20/11

This is the fourth of a set of five volumes which describe the software architecture for the Computational Structural Mechanics Testbed. Derived from NICE, an integrated software system developed at Lockheed Palo Alto Research Laboratory, the architecture is composed of the command language CLAMP, the command language interpreter CLIP, and the data manager GAL. Volumes 1, 2, and 3 (NASA CR's 178384, 178385, and 178386, respectively) describe CLAMP and CLIP and the CLIP-processor interface. Volumes 4 and 5 (NASA CR's 178387 and 178388, respectively) describe GAL and its low-level I/O. CLAMP, an acronym for Command Language for Applied Mechanics Processors, is designed to control the flow of execution of processors written for NICE. Volume 4 describes the nominal-record data management component of the NICE software. It is intended for all users. Author

N89-16368†# Lockheed Missiles and Space Co., Burbank, CA.
THE TAVERNS EMULATOR: AN ADA SIMULATION OF THE SPACE STATION DATA COMMUNICATIONS NETWORK AND SOFTWARE DEVELOPMENT ENVIRONMENT

NORMAN R. HOWES *In* NASA, Lyndon B. Johnson Space Center, First International Conference on Ada (R) Programming Language Applications for the NASA Space Station, Volume 2 10 p 1986
Avail: NTIS HC A22/MF A03 CSCL 09/2

The Space Station DMS (Data Management System) is the onboard component of the Space Station Information System (SSIS) that includes the computers, networks and software that support the various core and payload subsystems of the Space Station. TAVERNS (Test And Validation Environment for Remote Networked Systems) is a distributed approach for development and validation of application software for Space Station. The TAVERNS concept assumes that the different subsystems will be developed by different contractors who may be geographically separated. The TAVERNS Emulator is an Ada simulation of a TAVERNS on the ASD VAX. The software services described in the DMS Test Bed User's Manual are being emulated on the VAX together with simulations of some of the core subsystems and a simulation of the DCN. The TAVERNS Emulator will be accessible remotely from any VAX that can communicate with the ASD VAX. Author

N89-16371*# Computer Corp. of America, Cambridge, MA.
A DATABASE MANAGEMENT CAPABILITY FOR ADA
ARVOLA CHAN, SY DANBERG, STEPHEN FOX, TERRY LANDERS, ANIL NORI, and JOHN M. SMITH *In* NASA, Lyndon B. Johnson Space Center, First International Conference on Ada (R) Programming Language Applications for the NASA Space Station, Volume 2 20 p 1986
Avail: NTIS HC A22/MF A03 CSCL 09/2

The data requirements of mission critical defense systems have been increasing dramatically. Command and control, intelligence, logistics, and even weapons systems are being required to integrate, process, and share ever increasing volumes of information. To meet this need, systems are now being specified that incorporate data base management subsystems for handling storage and retrieval of information. It is expected that a large number of the next generation of mission critical systems will contain embedded data base management systems. Since the use of Ada has been mandated for most of these systems, it is important to address the issues of providing data base management capabilities that can be closely coupled with Ada. A comprehensive distributed data base management project has been investigated. The key deliverables of this project are three closely related prototype systems implemented in Ada. These three systems are discussed. Author

N89-16375*# McDonnell-Douglas Astronautics Co., Houston, TX.
SPACE STATION ADA RUNTIME SUPPORT FOR NESTED ATOMIC TRANSACTIONS Abstract Only
EDWARD J. MONTEIRO *In* NASA, Lyndon B. Johnson Space Center, First International Conference on Ada (R) Programming Language Applications for the NASA Space Station, Volume 2 1 p 1986
Avail: NTIS HC A22/MF A03 CSCL 09/2

The Space Station Data Management System (DMS), associated computing subsystems, and applications have varying degrees of reliability associated with their operation. A model has been developed (McKay '86) which allows the DMS runtime environment to appear as an Ada virtual machine to applications executing within it. This model is modular, flexible, and dynamically configurable to allow for evolution and growth over time. Support for Fault-tolerant computing is included within this model. The basic primitive involved in this support is based on atomic actions (Grey '78). An atomic action possesses two fundamental properties: (1) it is indivisible with respect to concurrent actions, and (2) it is indivisible with respect to failure. A transaction is a collection of atomic actions which collectively appear to be one action. Transactions may be nested, providing even more powerful support for reliability. A proposed approach is described for providing support for nested atomic transactions within the Ada runtime model developed for the Space Station environment. The level of support is modular, flexible and dynamically configurable just like the overall runtime support environment. Author

N89-16486# Oak Ridge National Lab., TN.
ATF (ADVANCED TOROIDAL FACILITY) DATA MANAGEMENT
K. L. KANNAN and L. R. BAYLOR 1988 11 p Presented at the 7th Topical Conference on High Temperature Plasma Diagnostics, Napa, CA, 13 Mar. 1988
(Contract DE-AC05-84OR-21400)
(DE89-001872; CONF-880364-36) Avail: NTIS HC A03/MF A01

Data management for the Advanced Toroidal Facility (ATF), a stellarator located at Oak Ridge National Laboratory (ORNL), is provided by DMG, a locally developed, VAX-based software system. DMG is a data storage and retrieval software system that provides the user interface to ATF raw and analyzed data. Data are described in terms of data models and data types and are organized as signals into files, which are internally documented. The system was designed with user accessibility, software maintainability, and extensibility as primary goals. Extensibility features include compatibility with ATF as it moves from pulsed to steady-state operation and capability for use of the DMG system with experiments other than ATF. DMG is implemented as a run-time library of routines available as a shareable image. General-purpose and specialized data acquisition and analysis applications have been developed using the DMG system. This paper describes the DMG system and the interfaces to it. DOE

N89-16749# Florida International Univ., Miami.
TECHNOLOGY TRANSFER FOR DEVELOPMENT OF COASTAL ZONE RESOURCES: CARIBBEAN EXPERTS EXAMINE CRITICAL ISSUES
C. SPECTER and D. GAYLE *In* ESA, Proceedings of the 1988 International Geoscience and Remote Sensing Symposium (IGARSS) '88 on Remote Sensing: Moving Towards the 21st Century, Volume 3 p 1449-1452 Aug. 1988
Copyright Avail: NTIS HC A99/MF A01; ESA Publications Division, ESTEC, Noordwijk, Netherlands, $120 US or 25^ Dutch guilders

Remote sensing utilization by developing countries for the exploration, development, and conservation of their marine/coastal zone resources is discussed. This technology is not being applied to development activities to the extent that it could be. Technological factors, as well as other significant factors in the transfer process, such as political and economic constraints, that hinder the flow of technology to the Caribbean area are assessed. Recommendations that may be useful to policy-makers and managers concerned with this technology transfer problem are considered. ESA

N89-21559# Naval Ocean Systems Center, San Diego, CA.
GRAPS (GRAPHICAL PLOTTING SYSTEM) USER'S GUIDE. A GRAPHICAL PLOTTING SYSTEM FOR DISPLAYING SCIENTIFIC AND ENGINEERING DATA Final Report, Sep. 1987 - Sep. 1988
JAMES C. LOGAN and JOHN STRAUCH Oct. 1988 31 p
(AD-A202583; NOSC/TD-1326) Avail: NTIS HC A03/MF A01
CSCL 12/5

This document provides an introduction and update to the Graphical Plotting System (GRAPS), a plotting utility developed by the Naval Ocean Systems Center for the personal computer. GRAPS provides a convenient, user-friendly tool for the display of engineering and scientific data in a number of conventional plot formats. Linear, semi-log, polar, log-log, Smith, and contour plot formats are among those that can be selected. User-friendly features include auto and user-defined scaling, text editing on graphics screens, and data file management options. Auto and user-defined scaling are new GRAPS features. The polar plots have been significantly improved and the contour plot added. The data file management options have also been expanded. GRAPS will plot any data stored in ASCII files in the GRAPS format. GRAPS is intended to be used as a stand-alone utility for the preparation and display of engineering and scientific data. It is not suitable for inclusion as part of another program, although subroutines could be stripped out for inclusion in other programs.

GRAPS is set up to read data from a disk file written (in ASCII) to a simple format. The disk file may be created by using an editor or word processor. Preferably, a subroutine may be included in the applications program to write the raw data directly to a disk file in the GRAPS format. GRA

N89-21730*# Tennessee Univ., Chattanooga. Center of Excellence for Computer Applications.
SIRE: A SIMPLE INTERACTIVE RULE EDITOR FOR NICBES
ALEX BYKAT *In* Alabama Univ., Research Reports: 1988 NASA/ASEE Summer Faculty Fellowship Program 22 p Dec. 1988
Avail: NTIS HC A99/MF E03 CSCL 09/1

To support evolution of domain expertise, and its representation in an expert system knowledge base, a user-friendly rule base editor is mandatory. The Nickel Cadmium Battery Expert System (NICBES), a prototype of an expert system for the Hubble Space Telescope power storage management system, does not provide such an editor. In the following, a description of a Simple Interactive Rule Base Editor (SIRE) for NICBES is described. The SIRE provides a consistent internal representation of the NICBES knowledge base. It supports knowledge presentation and provides a user-friendly and code language independent medium for rule addition and modification. The SIRE is integrated with NICBES via an interface module. This module provides translation of the internal representation to Prolog-type rules (Horn clauses), latter rule assertion, and a simple mechanism for rule selection for its Prolog inference engine. Author

N89-22133*# Lockheed Missiles and Space Co., Palo Alto, CA.
THE COMPUTATIONAL STRUCTURAL MECHANICS TESTBED ARCHITECTURE, VOLUME 2: DIRECTIVES
CARLOS A. FELIPPA Feb. 1989 364 p
(Contract NAS1-18444)
(NASA-CR-178385; NAS 1.26:178385; LMSC/D878511) Avail: NTIS HC A16/MF A02 CSCL 20/11

This is the second of a set of five volumes which describe the software architecture for the Computational Structural Mechanics Testbed. Derived from NICE, an integrated software system developed at Lockheed Palo Alto Research Laboratory, the architecture is composed of the command language (CLAMP), the command language interpreter (CLIP), and the data manager (GAL). Volumes 1, 2, and 3 (NASA CR's 178384, 178385, and 178386, respectively) describe CLAMP and CLIP and the CLIP-processor interface. Volumes 4 and 5 (NASA CR's 178387 and 178388, respectively) describe GAL and its low-level I/O. CLAMP, an acronym for Command Language for Applied Mechanics Processors, is designed to control the flow of execution of processors written for NICE. Volume 2 describes the CLIP directives in detail. It is intended for intermediate and advanced users. Author

N89-22188# Environmental Protection Agency, Research Triangle Park, NC. Atmospheric Sciences Research Lab.
METEOROLOGICAL PROCESSOR FOR REGULATORY MODELS (MPRM-1.1) USER'S GUIDE
JOHN S. IRWIN, JAMES O. PAUMIER, and ROGER W. BRODE (Office of Air Quality Planning and Standards, Research Triangle Park, NC.) Jul. 1988 225 p
(PB89-127526; EPA/600/3-88/043) Avail: NTIS HC A10/MF A02 CSCL 13/2

Version 1.1 of Meteorological Processor for Regulatory Models (MPRM) provides a general purpose computer processor for organizing available meteorological data into a format suitable for use by air quality dispersion models. Specifically, the processor is designed to accommodate those dispersion models that have gained EPA approval for use in regulatory decision making. MPRM can be envisioned as a three-stage system. The first stage retrieves the meteorological data from computer tape or disk files and processes the data through various quality assessment checks. The second stage collects all data available for a 24-hour period (upper air observations, hourly surface weather observations, and data collected as part of an on-site meteorological measurement program) and stores these data in a combined (merged) format. The third stage reads the merged meteorological data and performs the necessary processing to produce a meteorological data file suitable for use by the specified dispersion model. GRA

N89-22295# Pacific Northwest Lab., Richland, WA.
HANFORD METEOROLOGICAL STATION COMPUTER CODES. VOLUME 9: THE QUALITY ASSURANCE COMPUTER CODES
K. W. BURK and G. L. ANDREWS Feb. 1989 171 p
(Contract DE-AC06-76RL-01830)
(DE89-008414; PNL-6279-VOL-9) Avail: NTIS HC A08/MF A01

The Hanford Meteorological Station (HMS) was established in 1944 on the Hanford Site to collect and archive meteorological data and provide weather forecasts and related services for Hanford Site approximately 1/2 mile east of the 200 West Area and is operated by PNL for the U.S. Department of Energy. Meteorological data are collected from various sensors and equipment located on and off the Hanford Site. These data are stored in data bases on the Digital Equipment Corporation (DEC) VAX 11/750 at the HMS (hereafter referred to as the HMS computer). Files from those data bases are routinely transferred to the Emergency Management System (EMS) computer at the Unified Dose Assessment Center (UDAC). To ensure the quality and integrity of the HMS data, a set of Quality Assurance (QA) computer codes has been written. The codes will be routinely used by the HMS system manager or the data base custodian. The QA codes provide detailed output files that will be used in correcting erroneous data. The following sections in this volume describe the implementation and operation of QA computer codes. The appendices contain detailed descriptions, flow charts, and source code listings of each computer code. DOE

N89-22332*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
PROCEEDINGS OF THE SCIENTIFIC DATA COMPRESSION WORKSHOP
H. K. RAMAPRIYAN, ed. Washington, DC Feb. 1989 448 p Workshop held in Snowbird, UT, 3-5 May 1988; sponsored by NASA, Washington
(NASA-CP-3025; REPT-89B0038; NAS 1.55:3025) Avail: NTIS HC A19/MF A03 CSCL 09/2

Continuing advances in space and Earth science requires increasing amounts of data to be gathered from spaceborne sensors. NASA expects to launch sensors during the next two decades which will be capable of producing an aggregate of 1500 Megabits per second if operated simultaneously. Such high data rates cause stresses in all aspects of end-to-end data systems. Technologies and techniques are needed to relieve such stresses. Potential solutions to the massive data rate problems are: data editing, greater transmission bandwidths, higher density and faster media, and data compression. Through four subpanels on Science Payload Operations, Multispectral Imaging, Microwave Remote Sensing and Science Data Management, recommendations were made for research in data compression and scientific data applications to space platforms.

N89-22374# Argonne National Lab., IL. Mathematics and Computer Science Div.
A PROJECT FOR DEVELOPING A LINEAR ALGEBRA LIBRARY FOR HIGH-PERFORMANCE COMPUTERS
J. DEMMEL, J. DONGARRA, J. DUCROZ, A. GREENBAUM, S. HAMMARLING, and D. SORENSEN 1988 5 p Presented at the Symposium on the Solution of Super Large Problems in Computational Mechanics, Mystic, CT, 18 Oct. 1988
(Contract W-31-109-ENG-38)
(DE89-007501; CONF-8810262-2) Avail: NTIS HC A01/MF A01

Argonne National Laboratory, the Courant Institute for Mathematical Sciences, and the Numerical Algorithms Group, Ltd., are developing a transportable linear algebra library in FORTRAN 77. The library is intended to provide a uniform set of subroutines to solve the most common linear algebra problems and to run efficiently on a wide range of high-performance computers. To be effective, the new library must satisfy several criteria. First, it must

be highly efficient, or at least tunable to high efficiency, on each machine. Second, the user interface must be uniform across machines. Otherwise much of the convenience of portability will be lost. Third, the program must be widely available. NETLIB has demonstrated how useful and important it is for these codes to be available easily, and preferably on line. We intend to distribute the new library in a similar way, for no cost or a nominal cost only. In addition, the programs must be well documented. DOE

N89-23199# Sandia National Labs., Albuquerque, NM. Advanced Systems Development Dept.
ENGINEERING GRAPHICS SYSTEM (EGS) USER'S MANUAL
DAVID E. SALGUERO 31 Jan. 1989 395 p
(Contract DE-AC04-76DP-00789)
(DE89-009668; SAND-89-0156) Avail: NTIS HC A17/MF A03

The Engineering Graphics System (EGS) is a computer program for use on Digital Equipment Corporation VAXstation color workstations. Its purpose is to manage and plot sets of engineering analysis data for use in reports and presentations. It is capable of producing nearly any type of x-y plot from a set of tabulated data. After the plot curves have been retrieved from the tabulated data, EGS can be used to interactively modify the appearance of the plot for use in a report or presentation. Modifications appear on the workstation display exactly as they appear on final hardcopy, which avoids costly iterations. Hardcopy plots can be made on two different black and white laser printers and on two different color printers, and plots can be converted for use by the Interleaf technical publishing software. GRA

N89-24066# Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Engineering.
A DATABASE MANAGEMENT SYSTEM FOR COMPUTER-AIDED DIGITAL CIRCUIT DESIGN M.S. Thesis
SUE A. EHRHART Dec. 1988 101 p
(AD-A206047; AFIT/GCS/ENG/88D-4) Avail: NTIS HC A06/MF A01 CSCL 20/3

This thesis effort documents the design and implementation of a relational database and associated database management system (DBMS) for the AFIT digital circuit design environment, a graphics oriented tool that allows circuits to be designed at a uniform, chip-level of detail, checked for proper connections, and simulated. The approach to this effort included a survey of existing methods of Computer-Aided Design (CAD) data management, analysis of the data and data manipulation requirements of the design environment, design of a data manipulation language, and implementation of a DBMS to carry out the manipulations. GRA

N89-25162*# Georgia Inst. of Tech., Atlanta.
TRUSS: AN INTELLIGENT DESIGN SYSTEM FOR AIRCRAFT WINGS
PRESTON R. BATES and DANIEL P. SCHRAGE *In* NASA. Langley Research Center, Recent Advances in Multidisciplinary Analysis and Optimization, Part 1 p 333-355 Apr. 1989
Avail: NTIS HC A23/MF A03 CSCL 09/2

Competitive leadership in the international marketplace, superiority in national defense, excellence in productivity, and safety of both private and public systems are all national defense goals which are dependent on superior engineering design. In recent years, it has become more evident that early design decisions are critical, and when only based on performance often result in products which are too expensive, hard to manufacture, or unsupportable. Better use of computer-aided design tools and information-based technologies is required to produce better quality United States products. A program is outlined here to explore the use of knowledge based expert systems coupled with numerical optimization, database management techniques, and designer interface methods in a networked design environment to improve and assess design changes due to changing emphasis or requirements. The initial structural design of a tiltrotor aircraft wing is used as a representative example to demonstrate the approach being followed. Author

N89-26601*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
AN INTELLIGENT USER INTERFACE FOR BROWSING SATELLITE DATA CATALOGS
ROBERT F. CROMP and SHARON CROOK *In its* The 1989 Goddard Conference on Space Applications of Artificial Intelligence p 281-299 Apr. 1989
Avail: NTIS HC A17/MF A03 CSCL 09/2

A large scale domain-independent spatial data management expert system that serves as a front-end to databases containing spatial data is described. This system is unique for two reasons. First, it uses spatial search techniques to generate a list of all the primary keys that fall within a user's spatial constraints prior to invoking the database management system, thus substantially decreasing the amount of time required to answer a user's query. Second, a domain-independent query expert system uses a domain-specific rule base to preprocess the user's English query, effectively mapping a broad class of queries into a smaller subset that can be handled by a commercial natural language processing system. The methods used by the spatial search module and the query expert system are explained, and the system architecture for the spatial data management expert system is described. The system is applied to data from the International Ultraviolet Explorer (IUE) satellite, and results are given. Author

N89-27593# Sandia National Labs., Albuquerque, NM. Geo-Science Analysis Div.
DEVELOPING A GEOLOGIC AND ENGINEERING PROPERTIES DATA BASE WITH INGRES
MARGARET L. KREBS-JESPERSEN 1989 26 p Presented at the INGRES User Association Meeting, New Orleans, LA, 23 Apr. 1989
(Contract DE-AC04-76DP-00789)
(DE89-013520; SAND-89-0838C; CONF-8904194-3) Avail: NTIS HC A03/MF A01

The design of a data base for storing diverse geological and site engineering properties data from various sources using the INGRES data base management system has required: (1) designing tables for data that are similar but have very different test conditions to be reported; (2) determining what data is necessary to ensure that all records are unique; (3) changing, as necessary, the design of data base tables to accommodate the needs of new data submittals; (4) defining limits to comments and descriptions of test conditions to be stored in the data base; (5) solving problems caused by the limitations of the available field types in INGRES; and (6) designing a tracking system for data submissions to satisfy Project quality assurance requirements. The resulting relational data base design is simple, flexible, and capable of accommodating changes in requirements for data storage and user needs. The INGRES Report Writer utility has proven to be a powerful tool for generating reports because the Report Writer code is easily revised as table structure changes. Separate data storage tables can be joined for report production, and output can be customized for each user. DOE

N89-28121*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
BANGLADESH AGRO-CLIMATIC ENVIRONMENTAL MONITORING PROJECT Abstract Only
C. VERMILLION, H. MAURER, M. WILLIAMS, J. KAMOWSKI, T. MOORE, W. MAKSIMOVICH, H. OBLER, and E. GILBERT *In its* Laboratory for Oceans p 25-26 1988
Avail: NTIS HC A12/MF A02 CSCL 04/2

The Agro-Climatic Environmental Monitoring Project (ACEMP) is based on a Participating Agency Service Agreement (PASA) between the Agency for International Development (AID) and the National Oceanic and Atmospheric Administration (NOAA). In FY80, the Asia Bureau and Office of Federal Disaster Assistance (OFDA), worked closely to develop a funding mechanism which would meet Bangladesh's needs both for flood and cyclone warning capability and for application of remote sensing data to development problems. In FY90, OFDA provided for a High Resolution Picture Transmission (HRPT) receiving capability to improve their

forecasting accuracy for cyclones, flooding and storm surges. That equipment is primarily intended as a disaster prediction and preparedness measure. The ACEM Project was designed to focus on the development applications of remote sensing technology. Through this Project, AID provided to the Bangladesh Government (BDG) the equipment, technical assistance, and training necessary to collect and employ remote sensing data made available by satellites as well as hydrological data obtained from data collection platforms placed in major rivers. The data collected will enable the BDG to improve the management of its natural resources.
Author

N89-28447# Lawrence Livermore National Lab., CA.
PROBLEMS AND SOLUTIONS IN ONLINE DOCUMENTATION SYSTEMS
JEAN SHULER Jun. 1989 6 p Presented at the Cray User's Group Conference, Los Angeles, CA, 24 Apr. 1989
(Contract W-7405-ENG-48)
(DE89-014092; UCRL-101237; CONF-8904210-7) Avail: NTIS HC A02/MF A01

Pogo says we are surrounded by insurmountable opportunities. DOCUMENT, the online document system at NMFECC, has been continually enhanced and modified in the past 12 years to meet customer needs by analyzing the insurmountable opportunities (commonly called problems) that have arisen. We have analyzed where these documentation retrieval problems exist and solved these problems. The greatest challenge was to provide the customer with a stable system using the existing database of documents while adding new features and programs to retrieve information. Listed are four of the problems we have encountered, solutions are given and some indicators of success are shown.
DOE

N84-74361 RAND Corp., Santa Monica, CA.
INFORMATION TRANSFER IN SOVIET SCIENCE AND ENGINEERING
B. PARROTT Nov. 1981 56 p refs
(Contract ARPA ORDER 3520)
(RAND-R-2667-ARPA; ISBN-0-8330-0361-3)

N84-75267# Georgia Inst. of Tech., Atlanta.
EGYPTIAN NATIONAL SYSTEM FOR SCIENTIFIC AND TECHNICAL INFORMATION: DESIGN STUDY
V. SLAMECKA Nov. 1981 138 p refs
(Contract NSF INT-79-24187)
(PB84-179423; NSF/INT-81/002)

N85-70560# Naval Postgraduate School, Monterey, CA.
INFORMATION MANAGEMENT IN THE DEPARTMENT OF DEFENSE: THE ROLE OF LIBRARIES
G. D. WALTER, ed., C. MILLER, ed., C. I. ALEXANDER, ed., and P. SPINKS, ed. Jul. 1983 160 p refs Presented at 24th Mil. Librarians Workshop, Monterey, Calif., 15-17 Oct. 1980
(AD-A130345; NPS0142-83-001)

N88-70735 Nuclear Fuel Services, Inc., Erwin, TN.
COMPUTER AIDED RETRIEVAL OF VITAL RECORDS
STANFORD JOHNSON *In* DOE/Contractors Micrographics and Information Management Association, Proceedings of the 14th Annual Conference of the DOE/Contractors Micrographics and Information Management Association 9 p 1986
Avail: NTIS

N88-70736 Lawrence Livermore National Lab., CA. Technical Information Dept.
PROBLEMS OF STORING NONLINEAR DOCUMENTATION
GERALD R. GROW *In* DOE/Contractors Micrographics and Information Association, Proceedings of the 14th Annual Conference of the DOE/Contractors Micrographics and Information Management Association 8 p 1986
Avail: NTIS

N89-70023# California Univ., Berkeley. Lawrence Berkeley Lab.
USER'S GUIDE FOR THE TRAINING DATABASE SYSTEM, VERSION 2.1
A. KONRAD 2 Apr. 1986 53 p
(Contract DE-AC03-76SF-00098)
(DE88-016653; LBL-PUB-3043) Avail: NTIS

N89-70024# California Univ., Berkeley. Lawrence Berkeley Lab.
USER'S GUIDE FOR THE ENGNOTE DATABASE SYSTEM FOR LBL ENGINEERING NOTES, VERSION 1.2
A. KONRAD 30 Jul. 1986 35 p
(Contract DE-AC03-76SF-00098)
(DE88-016652; LBL-PUB-3057) Avail: NTIS

MANAGEMENT INFORMATION SYSTEMS

Management information systems (MIS) were around long before IRM came on the scene, but have a focus which can assist IRM. In addition, IRM gives a better focus to MIS.

A88-55330*#
SPACE STATION INFORMATION SYSTEMS
CLARENCE W. PITTMAN (NASA, Space Station Program Office, Reston, VA) IAF, International Astronautical Congress, 39th, Bangalore, India, Oct. 8-15, 1988. 10 p.
(IAF PAPER 88-059)

The utility of the Space Station is improved, the ability to manage and integrate its development and operation enhanced, and the cost and risk of developing the software for it is minimized by three major information systems. The Space Station Information System (SSIS) provides for the transparent collection and dissemination of operational information to all users and operators. The Technical and Management Information System (TMIS) provides all the developers with timely and consistent program information and a project management 'window' to assess the project status. The Software Support Environment (SSE) provides automated tools and standards to be used by all software developers. Together, these three systems are vital to the successful execution of the program.
Author

A89-21808
INTEGRATED RESOURCE SCHEDULING IN A DISTRIBUTED SCHEDULING ENVIRONMENT
DAVID ZOCH and GARDINER HALL (Ford Aerospace Corp., Seabrook, MD) (NASA, 1988 Goddard Conference on Space Applications of Artificial Intelligence, Greenbelt, MD, May 24, 1988) Telematics and Informatics (ISSN 0736-5853), vol. 5, no. 3, 1988, p. 229-240. Previously announced in STAR as N88-30342. refs
Copyright

The Space Station era presents a highly-complex multi-mission planning and scheduling environment exercised over a highly distributed system. In order to automate the scheduling process, customers require a mechanism for communicating their scheduling requirements to NASA. A request language that a remotely-located customer can use to specify his scheduling requirements to a NASA scheduler, thus automating the customer-scheduler interface, is described. This notation, Flexible Envelope-Request Notation (FERN), allows the user to completely specify his scheduling requirements such as resource usage, temporal constraints, and scheduling preferences and options. The FERN also contains mechanisms for representing schedule and resource availability information, which are used in the inter-scheduler inconsistency resolution process. Additionally, a scheduler is described that can accept these requests, process them, generate schedules, and return schedule and resource availability information to the requester. The Request-Oriented Scheduling Engine (ROSE) was designed to function either as an independent scheduler or as a

scheduling element in a network of schedulers. When used in a network of schedulers, each ROSE communicates schedule and resource usage information to other schedulers via the FERN notation, enabling inconsistencies to be resolved between schedulers. Individual ROSE schedulers are created by viewing the problem as a constraint satisfaction problem with a heuristically guided search strategy. Author

A89-27239
NASA ASTROPHYSICAL DATA SYSTEM (ADS) STUDY
G. F. SQUIBB (California Institute of Technology, Pasadena) and CYNTHIA Y. CHEUNG (BDM Corp., McLean, VA) IN: Astronomy from large databases: Scientific objectives and methodological approaches; Proceedings of the Conference, Garching, Federal Republic of Germany, Oct. 12-14, 1987. Garching, Federal Republic of Germany, European Southern Observatory, 1988, p. 489-496.
Copyright

The objectives and current status of a study initiated by NASA with the goal of defining the functional concepts for an astrophysics data system that would serve the astrophysics community into and through the 1990s are summarized. Major functional areas of particular importance are identified and discussed. These include availability of data, observation planning and operations, inter- and intra-agency interfaces, research support, and distributed system attributes. V.L.

N84-14984# Oak Ridge Gaseous Diffusion Plant, TN.
MANAGEMENT INFORMATION SYSTEM FOR ENGINEERING
R. O. GREEN, J. M. MORRISON, and R. H. WANTLAND 30 Aug. 1983 13 p Presented at the Am. Soc. for Eng. Management Ann. Meeting, Washington, D.C., 17 Oct. 1983
(Contract W-7405-ENG-26)
(DE84-001655; K/D-544; CONF-8310131-2) Avail: NTIS HC A03/MF A01

The engineering management information system (EMIS) is a computer based information system that integrates business management systems. System scope includes engineering work load, forecasting, cost, schedule, and selected administrative information. The EMIS was developed to provide a single source of current, official data. It is structured to meet a wide variety of needs, such as facilitating both uniform support of project management requirements associated with the uniquely different missions of the plants and control of the day to day operations of the engineering organization. DOE

N84-20425# Meridian Corp., Falls Church, VA.
REQUIREMENTS ANALYSIS FOR FORWARD FUNDING TRACKING SYSTEM, VOLUME 1 Final Report
1 Dec. 1983 49 p
(Contract MDA903-83-C-0342)
(AD-A136840) Avail: NTIS HC A03/MF A01 CSCL 05/1

Volume I of this report focuses on the efforts undertaken with respect to the requirements for a Forward Funding Tracking System. The purpose of this effort was to analyze the feasibility and cost effectiveness of developing a forward funding tracking system which was capable of utilizing existing DARPA data bases. Used in this context, forward funding tracking refers to the process by which DARPA commits, obligates, and ultimately manages its fiscal resources. The motivation behind this analysis was the need to provide the DARPA Program Management Office (PMO) with sufficient information to enable an informed decision regarding the effectiveness of potential approaches to financial management. This need is a principal concern to the PMO, since it is the responsibility of this office to plan, manage, and control, at the aggregate level, DARPA program funds and project scheduling. In addition, within the context of the overall DARPA mission to pursue high-risk, high-payoff R&D, it is incumbent upon the technical program offices to manage individual projects from a technical, cost, and schedule point of view. Consequently, the coordination of the resource requirements for management of these individual projects is also a primary concern to the PMO. GRA

N84-20426# Meridian Corp., Falls Church, VA.
REQUIREMENTS ANALYSIS FOR MILESTONE TRACKING SYSTEM, VOLUME 2 Final Report
1 Dec. 1983 17 p
(Contract MDA903-83-C-0342)
(AD-A136841) Avail: NTIS HC A03/MF A01 CSCL 05/2

Volume II of this report concerns the efforts undertaken with respect to a Milestone Tracking System. The purpose of this task was to analyze the feasibility and cost effectiveness of developing milestone tracking system for internal use within DARPA which was capable of utilizing existing DARPA data bases. As defined in this document, milestones include a wide range of internal and external developments as well as decision points which may be of interest to DARPA managers. Specifically, these include: Technical achievements; Technical decision points; Financial decision points; Point of inter-project dependencies; and External events/considerations. The purposes initially identified for a milestone tracking system were threefold. First, the system was envisioned to be a mechanism to provide program managers with a concise representation of their program activities. Second, the system was conceived to provide an automatic prompting of milestone and/or critical events identified by the user. Third, the system was viewed as a mechanism to retain an historical data base on the conduct of DARPA programs. It soon became evident that the system also had utility in providing input to programming decisions through the analysis of imbedded dependency networks. GRA

N84-21104# Human Engineering Labs., Aberdeen Proving Ground, MD.
HUMAN ENGINEERING GUIDELINES FOR MANAGEMENT INFORMATION SYSTEMS. CHANGE 1
D. E. HENDRICKS, P. W. KILDUFF, P. BROOKS, R. MARSHAK, and B. DOYLE 9 Jun. 1983 164 p
(AD-A137808; AD-E900298) Avail: NTIS HC A08/MF A01 CSCL 05/5

These guidelines are intended to be an aid for the inclusion of human factors considerations in the design of Management Information Systems (MIS). The US Army Material Development and Readiness Command (DARCOM) is faced with a problem of continuing growth in workload combined with constrained or decreasing numbers of personnel. Like many other corporate entities, DARCOM has decided to accelerate the growth of computer utilization in order to increase the productivity of the workforce. In addition to increased computer utilization, there is emphasis toward distributive processing. Distributive processing places computer power in the hands of the functional used which allows the user to interact with (manipulate) the data. Unfortunately, empirical evidence indicates that expenditures on computers are not accompanied, necessarily, by the expected rises in productivity. The paper resulting from this research from this research presented selected personnel data relevant to the design of computer systems and problems of human-computer interaction divided into eight areas: the system design process, system downtime, training, input, data manipulation or retrieval, output, the work station, and communication. (Hendricks, D.E., Man/Computer Interaction in DARCOM. A paper presented at the 1980 AMEDD Psychology Symposium at Walter Reed Army Medical Center, Washington, DC, October, 1980.) Appendix A contains a list of three problems. With an overview of systems and user characteristics, the research team combined that information with the results of an extensive literature search to develop these guidelines for inclusion of human factors considerations during system development or system improvement. GRA

N84-21403*# National Aeronautics and Space Administration, Washington, DC.
NASA ADMINISTRATIVE DATA BASE MANAGEMENT SYSTEMS, 1983
J. D. RADOSEVICH, ed. Apr. 1984 174 p refs Conf. held in Greenbelt, Md., 25-26 May 1983
(NASA-CP-2304; NAS 1.55:2304; REPT-2) Avail: NTIS HC A08/MF A01 CSCL 05/2

Technical and management problems associated with the evaluation, selection, installation, and use of data base management system packages in the NASA administrative support environment are examined.

N84-21405*# National Aeronautics and Space Administration, Washington, DC.
ACTION INFORMATION MANAGEMENT SYSTEM (AIMS): A USER'S VIEW
M. WISKERCHEN *In its* NASA Admin. Data Base Management Systems, 1983 p 9-12 Apr. 1984
Avail: NTIS HC A08/MF A01 CSCL 05/2

The initial approach used in establishing a user-defined information system to fulfill the needs of users at NASA Headquarters was unsuccessful in bringing this pilot endeaveor to full project status. The persistance of several users and the full involvement of the Ames Research Center were the ingredients needed to make the AIMS project a success. The lesson learned from this effort is that NASA should always work from its organizational strengths as a Headquarters-Center partnership. A.R.H.

N84-21406*# National Aeronautics and Space Administration, Washington, DC.
AUTOMATED RTOP MANAGEMENT SYSTEM
P. HAYES *In its* NASA Admin. Data Base Management Systems, 1983 p 13-18 Apr. 1984
Avail: NTIS HC A08/MF A01 CSCL 05/2

The structure of NASA's Office of Aeronautics and Space Technology electronic information system network from 1983 to 1985 is illustrated. The RTOP automated system takes advantage of existing hardware, software, and expertise, and provides: (1) computerized cover sheet and resources forms; (2) electronic signature and transmission; (3) a data-based information system; (4) graphics; (5) intercenter communications; (6) management information; and (7) text editing. The system is coordinated with Headquarters efforts in codes R,E, and T. A.R.H.

N84-21411*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
AUTOMATED ADMINISTRATIVE DATA BASES
M. D. MARRIE, J. R. JARRETT, S. A. REISING, and J. E. HODGE *In* NASA. Goddard Space Flight Center NASA Admin. Data Base Management Systems, 1983 p 85-88 Apr. 1984
Avail: NTIS HC A08/MF A01 CSCL 05/2

Improved productivity and more effective response to information requirements for internal management, NASA Centers, and Headquarters resulted from using automated techniques. Modules developed to provide information on manpower, RTOPS, full time equivalency, and physical space reduced duplication, increased communication, and saved time. There is potential for greater savings by sharing and integrating with those who have the same requirements. A.R.H.

N84-21415*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
NASA-WIDE STANDARD ADMINISTRATIVE SYSTEMS
P. SCHNECK *In* NASA. Goddard Space Flight Center NASA Admin. Data Base Management Systems, 1983 p 145-152 Apr. 1984
Avail: NTIS HC A08/MF A01 CSCL 05/2

Factors to be considered in developing agency-wide standard administrative systems for NASA include uniformity of hardware and software; centralization vs. decentralization; risk exposure; and models for software development. A.R.H.

N84-29802# General Electric Co., Saint Petersburg, FL. Neutron Devices Dept.
SUCCESS WITH DATA MANAGEMENT 4 AT THE DOE PINELLAS PLANT
M. A. DENTY 1983 13 p Presented at the Honeywell Large Systems Users Assoc. Forum 37, San Diego, Calif., 16 Oct. 1983
(Contract DE-AC04-76DP-00656)
(DE84-008021; GEPP-OP-754A; CONF-8310260-1) Avail: NTIS HC A03/MF A01

The data management design and implementation approach used on-line systems are described. One system supports purchasing and general stockroom; the other supports engineering product configuration definition and engineering drawing distribution control. Data base administration practices, transaction processing considerations, and data base design techniques, as well as the applications themselves. Problems solved and pitfalls avoided. DOE

N84-33266*# National Aeronautics and Space Administration, Washington, DC.
NASA ADMINISTRATIVE DATA BASE MANAGEMENT SYSTEMS, 1984
J. D. RADOSEVICH, ed. Sep. 1984 126 p refs Conf. held in Hampton, Va., 6-7 Jun. 1984
(NASA-CP-2323; NAS 1.55:2323) Avail: NTIS HC A07/MF A01 CSCL 05/2

Strategies for converting to a data base management system (DBMS) and the implementation of the software packages necessary are discussed. Experiences with DBMS at various NASA centers are related including Langley's ADABAS/NATURAL and the NEMS subsystem of the NASA metrology informaton system. The value of the integrated workstation with a personal computer is explored.

N84-33269*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
ADMINISTRATIVE AUTOMATION IN A SCIENTIFIC ENVIRONMENT
J. R. JARRETT *In* NASA, Washington NASA Admin. Data Base Management Systems, 1984 p 21-28 Sep. 1984
Avail: NTIS HC A07/MF A01 CSCL 05/2

Although the scientific personnel at GSFC were advanced in the development and use of hardware and software for scientific applications, resistance to the use of automation or purchase of terminals, software and services, specifically for administrative functions was widespread. The approach used to address problems and constraints and plans for administrative automation within the Space and Earth Sciences Directorate are delineated. Accomplishments thus far include reduction of paperwork and manual efforts; improved communications through telemail and committees; additional support staff; increased awareness at all levels on ergonomic concerns and the need for training; better equipment; improved ADP skills through experience; management commitment; and an overall strategy for automating. A.R.H.

N84-33270*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.
THE ADMINISTRATIVE WINDOW INTO THE INTEGRATED DBMS
G. H. BROCK *In* NASA, Washington NASA Admin. Data Base Management Systems, 1984 p 29-50 Sep. 1984
Avail: NTIS HC A07/MF A01 CSCL 05/2

A good office automation system manned by a team of facilitators seeking opportunities to serve end users could go a long way toward defining a DBMS that serves management. The problems of DBMS organization, alternative approaches to solving some of the major problems, problems that may have no solution, and how office automation fits into the development of the manager's management information system are discussed. A.R.H.

N84-34202# Sandia National Labs., Albuquerque, NM.
SANDIA NATIONAL LABORATORIES ADMINISTRATIVE DATA PROCESSING SYSTEMS
R. H. MCGEE, ed. and I. R. MITCHELL, ed. May 1984 110 p
(Contract DE-AC04-76DP-00789)
(DE84-014328; SAND-84-0231) Avail: NTIS HC A06/MF A01

The administrative data processing systems at Sandia Laboratories are divided into common systems, people systems,

property systems, procurement systems, and financial systems. The common systems consist of a data dictionary/directory system, which captures data field descriptions, common data input and retrieval systems, and the accounting title master system, the central authority for the accounting system. The people systems support personnel activities at Sandia. The property systems support property, material, inventory, documents, and records. Descriptions of property control, property accounting, property inventory control system, classified material accountability, classified document accountability, and others, are included. Procurement systems support procurement activity, including production of hard copy, summarized data, and procurement reports. Financial systems include payroll, employee accounts, financial modeling, budget, and others. S.B.

N85-11906# Naval Ship Research and Development Center, Bethesda, MD. Computation Mathematics/Logistics Dept.
A MANAGEMENT WORKSTATION CONCEPT
S. BERKOWITZ Jul. 1984 35 p
(AD-A145617; DTNSRDC/CMLD-84-17) Avail: NTIS HC A03/MF A01 CSCL 05/2

The David Taylor Naval Ship R&D Center is designing an automated, paperless environment for logistics functional managers at HQ, Naval Supply System Command. This paper asserts that technology is currently available to radically change the way that the logistics or financial manager deals with his business environment. The change would affect both quantitative and qualitative aspects of his work environment. In principle, the manager could summon up large volumes of data with a touch of a finger and gain analytical insight by interacting with and interpreting graphics displays. He could instantaneously communicate his newly-found perceptions and decisions through voice and hand-drawn sketches to a select, remote audience without benefit of keyboard and paper. As a practical matter, however, the separate technologies that would accommodate such office power still need to be integrated at a marketable price. Moreover, keyboard and paper may be preferable modes of entry for some managers. Until continuous speech and unconstrained hand-lettered recognition become practical realities for large vocabularies, mundane activities such as editing (formatting, composition, publication, distribution) may best be left to a support staff. GRA

N85-12790# Lesley Coll., Cambridge, MA.
MAINTENANCE MANAGEMENT INFORMATION AND CONTROL SYSTEM (MMICS): ADMINISTRATIVE BOON OR BURDEN
T. P. MURRAY Mar. 1984 59 p
(AD-A145762) Avail: NTIS HC A04/MF A01 CSCL 05/2

Thirteen years of Air Force design and development went into the Maintenance Management Information and Control System (MMICS), an automated maintenance information system, because maintenance managers need fast, up-to-date maintenance-related data. MMICS is an on-line computer system accessed through remote terminals located in the work area. These terminals communicate with a central base-level computer via telephone circuits. MMICS has wide application and provides automated information to managers of aircraft, missile and communications-electronic organizations. MMICS is currently in operation at one hundred forty Air Force units located at more than one hundred bases. Approximately eight hundred remote terminals and five hundred line printers are installed and in use world-wide. In aircraft maintenance organizations, MMICS provides information on changing aircraft and equipment conditions, parts requirements, aircraft schedules, equipment status and personnel resources and training. Personnel training is an important aspect of a manager's job and is vital to any organization that must maintain a proficient and experienced work force. The purpose of the project is to examine, determine and evaluate the benefit of the MMICS to managers and supervisors in conducting and monitoring training and training programs within their sections. GRA

N85-13675# Pacific Northwest Lab., Richland, WA.
EXECUTIVE INFORMATION SYSTEM
M. VITULLO, C. WINTER, and D. R. JOHNSON Jul. 1984 96 p
(Contract DE-AC06-76RL-01830)
(DE84-015355; PNL-5190) Avail: NTIS HC A05/MF A01

The Executive Information System (EIS) is a computer-based information handling system. The system was designed and implemented for energy conversion and utilization technologies to allow program managers easy access and tracking of certain types of reporting at various levels of management interaction, to simplify the handling of program-related data, and to streamline the preparation of reporting documents and responses to requests for information from the program. The EIS is especially useful in assisting DOE program managers in the routine dissemination of reports and information. The characteristics of each component of the EIS are discussed. A user's guide to the EIS is included. DOE

N85-23451# Los Alamos Scientific Lab., NM.
INTEL IDIS EVALUATION
J. M. CHEADLE and M. E. GLASSMIRE 1984 7 p Presented at the Assoc. of System 2000 Users for Technol. Exchange (ASTUTE) Conf., Hilton Head, S.C., 11-15 Nov. 1984
(Contract W-7405-ENG-36)
(DE85-003748; LA-UR-84-3537; CONF-8411114-2) Avail: NTIS HC A02/MF A01

An evaluation of a computer system called the Intel Database Information System (IDIS), which was recently performed at the Los Alamos National Laboratory is discussed. The evaluation consisted of the development of a possible application for the Compensation and Benefits Section of the Personnel Administration Division at Los Alamos. DOE

N85-26439* National Aeronautics and Space Administration, Washington, DC.
MANAGEMENT: A BIBLIOGRAPHY FOR NASA MANAGERS
Mar. 1985 183 p
(NASA-SP-7500(19); NAS 1.21:7500(19)) Avail: NTIS HC A09 CSCL 05/1

This bibliography lists 706 reports, articles, and other documents introduced into the NASA scientific and technical information system in 1984. Entries, which include abstracts, are arranged in the following categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy. Subject, personal author, corporate source, contract number, report number, and accession number indexes are included. A.R.H.

N85-27739# Naval Postgraduate School, Monterey, CA.
COMPILATION OF ABSTRACTS OF THESES SUBMITTED BY CANDIDATES FOR DEGREES Report, for 1 Oct. 1982 - 30 Sep. 1983
Jun. 1984 509 p
(AD-A151722; NPS-012-84-004PR) Avail: NTIS HC A22/MF A03 CSCL 05/2

This publication contains the abstracts of theses submitted during the period 1 October 1982 - 30 September 1983 by candidates for Masters, Engineers, and Doctors degrees at the Naval Postgraduate School, Monterey, CA 93943. Degrees are in Aeronautical engineers, mechanical engineers, applied mathematics, applied science, computer science, electrical engineering, information systems, management, mechanical engineering, meteorology and oceanography, operations research, national security affairs and others. GRA

N85-27752# Naval Postgraduate School, Monterey, CA.
DATA DICTIONARY DESIGN AS A STEPPING-STONE TO DBMS (DATA BASE MANAGEMENT SYSTEM) IMPLEMENTATION IN THE INDONESIAN ARMY DATA COLLECTING AND PROCESSING SERVICE M.S. Thesis
B. SUTEDJO Sep. 1984 86 p
(AD-A152101) Avail: NTIS HC A05/MF A01 CSCL 09/2

The organizational structure, tasks, and system configuration of the Indonesian Army Data Collecting and Processing Service (DISPULLAHTAD) are presented briefly in order to provide a background for succeeding discussions. Features of available data dictionary systems (DDS) and the initial design of a data dictionary for current applications at DISPULLAHTAD are presented. Finally, based on that initial design, a recommendation for database management system (DBMS) implementation is discussed. dictionary schema; DISPULLAHTAD; Data dictionary features; GRA

N85-29849# Logistics Management Inst., Bethesda, MD.
IMPROVING THE DEFENSE ENERGY INFORMATION SYSTEM (DEIS)
M. J. KONVALINKA and J. E. LENGEL Jan. 1985 43 p
(Contract MDA903-81-C-0166)
(AD-A153524; LMI-ML405) Avail: NTIS HC A03/MF A01 CSCL 05/2

This report provides recommendations for improvements to the Defense Energy Information System (DEIS), an automated management information system with which DOD monitors its supplies and consumption of energy. DEIS provides information about DOD's bulk petroleum products: inventory, consumption, resupply, and sale - as well as inventory and consumption of energy for utility services. The recommendations focus on the DEIS operational environment, the need for more energy management reports, and the use of microcomputers with DEIS. GRA

N85-29854# National Bureau of Standards, Gaithersburg, MD. Center for Applied Mathematics.
NATIONAL ARCHIVES AND RECORDS SERVICE (NARS) TWENTY YEAR PRESERVATION PLAN
A. CALMES (National Archives and Records Service), R. SCHOFER, and K. R. EBERHARDT 10 Jan. 1985 70 p
Sponsored by National Archives and Records Service
(PB85-177640; NBSIR-85-2999) Avail: NTIS HC A04/MF A01 CSCL 05/2

The purpose of this preservation plan is to identify types, extent of programs and resource requirements to bring the preservation needs of the National Archives and Records Service (NARS) to a current status of the end of twenty-two years. Data for developing the plan was derived from a scientific survey of holdings, data obtained from interviews with NARS' archivists, earlier studies and observation of operations. The recommended plan is divided into nine action categories: (1) environmental control; (2) holdings maintenance of current holdings; (3) holdings maintenance as a part of the accessioning process; (4) interception, assessment and protection at time of use; (5) systematic duplication of impermanent documents; (6) reproduction of frequently used documents; (7) laboratory treatment of intrinsically valuable documents; (8) laboratory conservation of treasures; and (9) preservation of nontextual records. Author (GRA)

N85-30967# R-K Research and System Design, Malibu, CA.
TEST AND EVALUATION MASTER PLAN (TEMP) FOR THE NAVY OCCUPATIONAL HEALTH INFORMATION MANAGEMENT SYSTEM (NOHIMS). PHASE 1: APPENDIX A THROUGH APPENDIX U Final Report
24 Apr. 1985 417 p
(Contract N00014-84-C-0601)
(AD-A154179) Avail: NTIS HC A18/MF A03 CSCL 09/2

Under the work statement for Phase 1 of this Contract the Contractor was tasked to duvelop a Test and Evaluation Master Plan (TEMP) for the Navy Occupational Health Information Management System (NOHIMS) that addresses nine areas of system functioning: responsiveness to Navy needs and requirements; design suitability; efficiency; enhancement of medical monitoring; use of the NOHIMS database for legal evidence; usability of NOHIMS; cost analysis; transferability of NOHIMS; and NOHIMS as an aid to research. The Final Report for Phase 1 of this contract is comprised of the following set of Structured Interviews for Medical Care Provider Users; Industrial Users; (Industrial Hygienists/Work Center Supervisors); Data Entry Personnel; Contracted NOHIMS Developers; NHRC NOHIMS Developers; NHRC Interim System Developers; Test Site Administrators/System Managers; Higher Level Navy Management; NEHC Project Management Team; Navy Legal Counsel; and for NHRC/Bremerton ADP Personnel; Stated Navy Goals and Objectives; System Description and Design Features; Standard Reports; Data Collection Forms/Sources; Medical Monitoring and Care Goals; Information Needs for Legal Purposes; Development Costs and Intended Benefits; Description of Government-Owned Occupational Health Information Systems; Description of Commercially Available Occupational Health Information Systems; and Description of Navy Interim Occupational Health Information System. GRA

N86-13227# Corps of Engineers, Saint Paul, MN.
INFORMATION SYSTEMS PLAN
Apr. 1985 272 p
(AD-A157911) Avail: NTIS HC A12/MF A02 CSCL 09/2

The purpose of this study is to analyze what information the St. Paul District uses, who needs to share data, what are the costs of information management, and who should be responsible for information management. This pilot project authorizes the District to demonstrate the feasibility of automated approaches through the acquisition and use of high technology equipment. GRA

N86-15171*# McDonnell-Douglas Technical Services Co., Inc., Houston, TX.
TECHNICAL AND MANAGEMENT INFORMATION SYSTEM: THE TOOL FOR PROFESSIONAL PRODUCTIVITY ON THE SPACE STATION PROGRAM
G. MONTOYA and P. BOLDON *In* NASA. Johnson (Lyndon B.) Space Center R and D Productivity: New Challenges for the US Space Program p 149-164 1985 refs
Avail: NTIS HC A25/MF A04 CSCL 05/1

The Space Station Program is highly complex not only in its technological goals and requirements but also in its organizational structure. Eight Contractor teams supporting four NASA centers plus Headquarters must depend on effective exchange of information--the lifeblood of the program. The Technical and Management Information System (TMIS) is the means by which this exchange can take place. Value of the TMIS in increasing productivity comes primarily from its ability to make the right information available to whomever needs it when it is needed. Productivity of the aerospace professional and how it can be enhanced by the use of specifically recommended techniques and procedures for information management using the TMIS are discussed. Author

N86-16153# Navy Personnel Research and Development Center, San Diego, CA.
IMPLEMENTATION OF MULTIFUNCTION INFORMATION SYSTEMS AT THREE NAVY FACILITIES Final Report, Jul. 1982 - Sep. 1983
J. P. SHEPOSH, V. N. HULTON, S. D. RAMRAS-BERLIN, and T. T. TRINH Jan. 1985 40 p
(AD-A157797; NPRDC-TR-85-17) Avail: NTIS HC A03/MF A01 CSCL 05/1

The accelerated rate of the introduction of office technology systems in both the private and public sectors has had important effects on organizational functioning. In light of the developments and increased usage of this technology, it is important to address issues and problems that arise in the course of implementing these new systems. The objective of this investigation was to evaluate the impact of pilot projects employing multifunction

information systems at three Navy facilities. The major aims of the study were to determine: (1) the receptiveness of organizational personnel toward the technological system, (2) pattern of usage of the systems, (3) the major factors impeding and facilitating operation of the system, (4) the impact of the systems on work performance, and (5) the organizational problems and issues associated with the introduction and implementation of the systems. A cross section of civil service personnel (39 support, 44 technical, and 35 managerial) involved with the implementation and/or use of the systems at the three sites was interviewed. The interviews were designed to obtain information about acceptance of the system, usage, system impact on performance, and system implementation problems. The results indicated that resistance to change was not a major problem in the introduction and implementation of these systems. Barriers encountered by members of the organization such as insufficient management commitment and lack of personnel and material resources were more serious problems. GRA

N86-24552# Naval Postgraduate School, Monterey, CA.
MICROCOMPUTER-BASED DETACHMENT ADMINISTRATIVE MANAGEMENT SYSTEM FOR THE LAMPS (LIGHT AIRBORNE MULTI-PURPOSE SYSTEM) COMMUNITY. A REQUIREMENTS ANALYSIS M.S. Thesis
G. F. SMITH Sep. 1985 157 p
(AD-A162366) Avail: NTIS HC A08/MF A01 CSCL 09/2

This thesis presents a requirements analysis of a microcomputer based system to be used by sea-going Light Airborne Multipurpose System (LAMPS) detachment for administrative data management and recurring reports generation. Included are the results of user interviews which were conducted to determine possible system functions. These functions, through analysis, are presented in a hierarchical charting with data flow diagrams and accompanying processing narratives. System data is then presented in data dictionary format. Recommendations are made as to possible system implementation and design. GRA

N86-24561# Mitre Corp., Bedford, MA.
AIR FORCE GEOPHYSICS LABORATORY MANAGEMENT INFORMATION SYSTEM STUDY Final Report
A. A. HAYEN Nov. 1985 40 p
(Contract F19628-84-C-0001)
(AD-A161910; MTR-9338; ESD-TR-85-114) Avail: NTIS HC A03/MF A01 CSCL 05/1

MITRE has conducted a study to define the management information needs of Air Force Geophysics Laboratory (AFGL) managers and to investigate alternative approaches forthe implementation of a management information system (MIS) at AFGL. The study summarizes current management and administrative practices at AFGL. Requirements have been identified for automating several currently manual functions to compile accurate and timely information to better manage and plan AFGL programs. This document describes the functions and relative priorities of five MIS subsystems and provides suggestions for implementation solutions. Creation of a detailed Development Plan is recommended as the follow-on task. Author (GRA)

N86-25999# Stanford Univ., CA. Dept. of Statistics.
DATA BASE MANAGEMENT: PROCEEDINGS OF A CONFERENCE
31 Jul. 1985 307 p refs Conference held in Monterey, Calif., 1-2 Nov. 1984
(Contract N00014-76-C-0476; NR PROJ. 042-267)
(AD-A158285) Avail: NTIS HC A14/MF A02 CSCL 09/2

Data base management systems were discussed. Topics included data base organization for statistical analysis; machine learning; information retrieval; information management; and computer architecture.

N86-27108* National Aeronautics and Space Administration, Washington, DC.
MANAGEMENT: A BIBLIOGRAPHY FOR NASA MANAGERS
Apr. 1986 169 p
(NASA-SP-7500(20); NAS 1.21:7500(20)) Avail: NTIS HC A08 CSCL 05/1

This bibliography lists 707 reports, articles and other documents introduced into the NASA scientific and technology information system in 1985. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy. Author

N87-20833* National Aeronautics and Space Administration, Washington, DC.
MANAGEMENT: A BIBLIOGRAPHY FOR NASA MANAGERS (SUPPLEMENT 21)
Apr. 1987 70 p
(NASA-SP-7500(21); NAS 1.21:7500(21)) Avail: NTIS HC A04 CSCL 05/1

This bibliography lists 664 reports, articles and other documents introduced into the NASA scientific and technical information system in 1986. Items are selected and grouped according to their usefulness to the manager as manager. Citations are grouped into ten subject categories: human factors and personnel issues; management theory and techniques; industrial management and manufacturing; robotics and expert systems; computers and information management; research and development; economics, costs, and markets; logistics and operations management; reliability and quality control; and legality, legislation, and policy. Author

N87-24233# Oak Ridge National Lab., TN.
THE SUCCESS OR FAILURE OF MANAGEMENT INFORMATION SYSTEMS: A THEORETICAL APPROACH
T. R. CURLEE and B. T. TONN Mar. 1987 29 p
(Contract DE-AC05-84OR-21400)
(DE87-007802; ORNL/TM-10320) Avail: NTIS HC A03/MF A01

Work has been done by various disciplines to address the reasons why modern, computerized management information systems either succeed or fail. However, the studies are not based on a well-defined conceptual framework and the focus has been narrow. This report presents a comprehensive conceptual framework of how an information system is used within an organization. This framework not only suggests how the use of an information system may translate into productivity improvements for the implementing organization but also helps to identify why a system may succeed or fail. A major aspect of the model is its distinction between the objectives of the organization in its decision to implement an information system and the objectives of the individual employees who are to use the system. A divergence between these objectives can lead to system under-utilization or misuse at the expense of the organization's overall productivity. DOE

N88-17207*# Air Force Human Resources Lab., Wright-Patterson AFB, OH.
IMIS: INTEGRATED MAINTENANCE INFORMATION SYSTEM. A MAINTENANCE INFORMATION DELIVERY CONCEPT
JOSEPH C. VONHOLLE *In* NASA. Lyndon B. Johnson Space Center, Houston, Texas, First Annual Workshop on Space Operations Automation and Robotics (SOAR 87) p 1-9 Oct. 1987
Avail: NTIS HC A23/MF A04 CSCL 05/2

The Integrated Maintenance Information System (IMIS) will optimize the use of available manpower, enhance technical performance, improve training, and reduce the support equipment and documentation needed for deployment. It will serve as the technician's single, integrated source of all the technical information required to perform modern aircraft maintenance. Author

N88-25374# Pentagon Library, Washington, DC.
MANAGEMENT AND THE EXECUTIVE Final Report, 1 Jan. 1982 - 31 Dec. 1987
1 Jan. 1988 44 p
(AD-A190778) Avail: NTIS HC A03/MF A01 CSCL 05/1

This bibliography lists books and periodical articles covering such topics as personnel management, corporate planning, decision-making, executive training, leadership, management information systems, and organizational behavior. In addition, it highlights some special interest areas: women executives, chief executive officers, job stress, and ethics. An index of management topics is appended to assist readers in finding related items.
GRA

N89-10070*# Jet Propulsion Lab., California Inst. of Tech., Pasadena.
DEEP SPACE NETWORK RESOURCE SCHEDULING APPROACH AND APPLICATION
WILLIAM C. EGGEMEYER and ALAN BOWLING *In* NASA, Goddard Space Flight Center, Proceedings of 1987 Goddard Conference on Space Applications of Artificial Intelligence (AI) and Robotics 9 p 1987
Avail: NTIS HC A99/MF E03 CSCL 05/1

Deep Space Network (DSN) resource scheduling is the process of distributing ground-based facilities to track multiple spacecraft. The Jet Propulsion Laboratory has carried out extensive research to find ways of automating this process in an effort to reduce time and manpower costs. This paper presents a resource-scheduling system entitled PLAN-IT with a description of its design philosophy. The PLAN-IT's current on-line usage and limitations in scheduling the resources of the DSN are discussed, along with potential enhancements for DSN application. Author

N89-10071*# Computer Sciences Corp., Beltsville, MD. System Sciences Div.
SPACE STATION PLATFORM MANAGEMENT SYSTEM (PMS) REPLANNING USING RESOURCE ENVELOPES
JOY LEE BUSH, ANNA CRITCHFIELD, and AUDREY LOOMIS *In* NASA, Goddard Space Flight Center, Proceedings of 1987 Goddard Conference on Space Applications of Artificial Intelligence (AI) and Robotics 17 p 1987
Avail: NTIS HC A99/MF E03 CSCL 05/1

One of the responsibilities of the Space Station Platform Management System (PMS) is to maintain constraint-free, short-term plans for platform and free-flyer activities. Both the replanning function and the associated constraint-checking function are viewed as potentially requiring expert system assistance. The PMS Resource Envelope Scheduling System (PRESS) expert system, which is currently under development, is described. The PRESS capabilities will include the following: plan, replan, and perform constraint checking using resource envelopes resembling those required for telescience; initialize itself using the results fo a previous run; infer the replanning needs associated with a change in resource availability; allow the user to determine the level of interaction (including an advisory capability) with the system during execution; and generate both a graphic timeline and a report as output. The PRESS is being developed on an IBM PC/AT using TeKnowledge, Inc.'s M.1 expert system shell. The PRESS activity definitions and constraints are based on those defined for the Cosmic Background Explorer (COBE) mission scheduled for launch in early 1989. Author

N89-10078*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
AUTOMATION OF SPACECRAFT CONTROL CENTERS
ROBERT DUTILLY *In its* Proceedings of 1987 Goddard Conference on Space Applications of Artificial Intelligence (AI) and Robotics 9 p 1987
Avail: NTIS HC A99/MF E03 CSCL 05/1

The objective is to describe the further automation of the Payload Operations Control Centers, specifically the Mission Operations Room, by using a series of expert systems interconnected together. The feasibility of using expert systems in the Mission Operations Room is presently being determined. The expert system under development is called the Communications Link Expert Assistance Resource (CLEAR) project. It is the first control center expert system being designed and implemented at Goddard. It will demonstrate the feasibility and practicality of expert systems in a real-time control center environment. There is a two-fold purpose. First is to briefly describe the present effort of the CLEAR expert system under development. The second is to describe how a series of interacting expert systems could be developed to almost totally automate the Mission Operations Room within the control center. How these expert systems would be put together and what functions they could perform in the control center is described. These efforts will provide a great deal of applicability toward the automation of the space station. Author

N89-13912# San Jose State Univ., CA.
THE LANGUAGE OF DATA: A GENERAL THEORY OF DATA
JAMES L. DOLBY, NANCY CLARK, ed., and WILLIAM H. ROGERS (RAND Corp., Santa Monica, Calif.) *In* Colorado State Univ., Computer Science and Statistics. Proceedings of the 18th Symposium on the Interface p 96-103 26 Aug. 1987
Avail: NTIS HC A20/MF A03 CSCL 12/6

The general theory represented by the Language of Data has a number of implications for the communication of information, a documentation system for databases, storage and retrieval systems, computational aids for analysis, and the construction of survey instruments. More important, it provides a general framework for a systematic approach to the communication of information through data. Author

N89-13913# San Jose State Univ., CA.
INTELLIGENT DATA MANAGEMENT
HENSON GRAVES and RUTH MANOR *In* Colorado State Univ., Computer Science and Statistics. Proceedings of the 18th Symposium on the Interface p 104-109 26 Aug. 1987 Prepared in cooperation with Tel-Aviv Univ., Israel
Avail: NTIS HC A20/MF A03 CSCL 12/6

Intelligent computer support for statistical data analysis requires a system in which descriptive information is represented and used deductively to answer questions from data, definitions and assumptions. The knowledge representation requirements for supporting data analysis include flexibility in interactively introducing changes in the system and the capability of handling data revision and data discrepancy. Outlined here are a formalism for representing descriptive information and auxillary assumptions for data analysis. This formalism is currently being developed and implemented in the Algos computational system. Author

N89-13954# Department of Agriculture, Washington, DC.
COMPUTER-AIDED SURVEY METHODS
ROBERT D. TORTORA, FREDERIC A. VOGEL, and J. MERRILL SHANKS (California Univ., Berkeley.) *In* Colorado State Univ., Computer Science and Statistics. Proceedings of the 18th Symposium on the Interface p 411-413 26 Aug. 1987
Avail: NTIS HC A20/MF A03 CSCL 12/6

Computer-assisted survey methods that are being planned, tested, and implemented by the Statistical Reporting Service (SRS) of the U.S. Department of Agriculture for its 44 data collection offices across the United States are described. The major activities include developing a data management system along with computer-aided sampling frame maintenance, computer-aided survey management, and computer assisted telephone interviewing systems. Author

N89-14177# Idaho National Engineering Lab., Idaho Falls. Systems Architecture.
INFORMATION RESOURCE MANAGEMENT: AN ARCHITECTURAL CONCEPT/EXPERIENCE
M. KENT LINSENMANN 1988 20 p Presented at the International Software AG Users Group, Nashville, Tenn., 25 Sep. 1988
(Contract DE-AC07-76ID-01570)

(DE88-015184; EGG-M-88216; CONF-8809112-1) Avail: NTIS HC A03/MF A01

This paper contains an integrated Database System strategy utilizing a System Architecture concept comprised of the following components: Data Integration (Data Administration and Database Administration); Single-System change (Application Architecture); and Business System Integration. DOE

N89-14933*# OAO Corp., Greenbelt, MD.
PROMIS (PROCUREMENT MANAGEMENT INFORMATION SYSTEM) Final Report
23 Sep. 1987 23 p
(Contract NAS8-35928)
(NASA-CR-179395; NAS 1.26:179395) Avail: NTIS HC A03/MF A01 CSCL 05/1

The PROcurement Management Information System (PROMIS) provides both detailed and summary level information on all procurement actions performed within NASA's procurement offices at Marshall Space Flight Center (MSFC). It provides not only on-line access, but also schedules procurement actions, monitors their progress, and updates Forecast Award Dates. Except for a few computational routines coded in FORTRAN, the majority of the systems is coded in a high level language called NATURAL. A relational Data Base Management System called ADABAS is utilized. Certain fields, called descriptors, are set up on each file to allow the selection of records based on a specified value or range of values. The use of like descriptors on different files serves as the link between the falls, thus producing a relational data base. Twenty related files are currently being maintained on PROMIS. Author

N89-14946*# City Univ. of New York, Staten Island. Dept. of Computer Science.
RESIDENT DATABASE INTERFACES TO THE DAVID SYSTEM, A HETEROGENEOUS DISTRIBUTED DATABASE MANAGEMENT SYSTEM Final Report
MARSHA MOROH 15 Dec. 1988 12 p
(Contract NAG5-763)
(NASA-CR-184615; NAS 1.26:184615) Avail: NTIS HC A03/MF A01 CSCL 05/2

A methodology for building interfaces of resident database management systems to a heterogeneous distributed database management system under development at NASA, the DAVID system, was developed. The feasibility of that methodology was demonstrated by construction of the software necessary to perform the interface task. The interface terminology developed in the course of this research is presented. The work performed and the results are summarized. Author

N89-14948*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
USL/DBMS NASA/RECON WORKING PAPER SERIES. STANDARDS Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. and FRANK Y. CHUM 29 Mar. 1984 38 p Revised Prepared in cooperation with Southern Univ., Baton Rouge, LA
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184508; NAS 1.26:184508) Avail: NTIS HC A03/MF A01 CSCL 05/2

The USL/DBMS NASA/RECON Working Paper Series contains a collection of reports representing results of activities being conducted by the Computer Science Department of the University of Southwestern Louisiana pursuant to the specifications of NASA Contract number NASw-3846. The work on this portion of the contract is being performed jointly by the University of Southwestern Louisiana and Southern University. This report contains the full set of standards for the development, formatting, reviewing, and issuance of entries within the USL/DBMS NASA/RECON Working Paper Series. Author

N89-14966*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
NATURAL LANGUAGE QUERY SYSTEM DESIGN FOR INTERACTIVE INFORMATION STORAGE AND RETRIEVAL SYSTEMS. PRESENTATION VISUALS M.S. Thesis Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. and I-HSIUNG LIU 22 Apr. 1985 53 p Prepared in cooperation with Southern Univ., Baton Rouge, LA
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184526; NAS 1.26:184526; DBMS.NASA/RECON-18)
Avail: NTIS HC A04/MF A01 CSCL 05/2

This Working Paper Series entry represents a collection of presentation visuals associated with the companion report entitled Natural Language Query System Design for Interactive Information Storage and Retrieval Systems, USL/DBMS NASA/RECON Working Paper Series report number DBMS.NASA/RECON-17. Author

N89-15787# Oak Ridge National Lab., TN. Data Systems Research and Development Program.
USERS MANUAL FOR THE RESEARCH NOTES SYSTEM (VERSION 1.5)
DEAN S. HARTLEY, III May 1988 207 p
(Contract DE-AC05-84OR-21400)
(DE89-001391; ORNL/DSRD/TM-18) Avail: NTIS HC A10/MF A02

The purpose of the Research Notes System (RNS) is to help collect and organize information. The information the RNS manages consists of notes which are typed into the system, references to the source of the note, and subject classifications of the note. The RNS may be used to organize the reference material (books, reprints of papers, etc.) which researchers typically accumulate, or it may be used in a directed search for a project, or both. The Research Notes System is a set of dBASE III programs and relational databases which meets this need. The RNS provides ease of data entry through the use of relational databases to minimize redundant data entry. The information is organized by keying each note to one or more user-defined subjects. The RNS also provides several retrieval methods for use during intermediate research phases and in the final-article writing phase. The RNS provides an update function so that a Master RNS may be maintained with multiple users of RNS copies. This document details the procedures necessary to use the RNS. Areas covered include benefits, input data dictionaries and tips on using the RNS, as well as detailed operating instructions. The operating instructions describe each operating step and each option with complete illustrations of the screen prompts and displays. The installation section describes how to use the system on a hard disk (the recommended hardware for the system) and on floppy disks. DOE

N89-16407# Department of the Air Force, Washington, DC. Artificial Intelligence Center.
INFORMATION MANAGEMENT EXPERT SYSTEMS
ROBERT MILNE *In* National Academy of Sciences - National Research Proceedings of the Workshop on AI (Artificial Intelligence), and Distributed Problem Solving p 159-165 May 1985
Avail: NTIS HC A08/MF A01 CSCL 09/2

A collection of ideas and history relating to artificial intelligence and information management is given. The history and the purpose of the Army Artificial Intelligence Center is given. Frame-based constraint systems and their role are described. A few comments are made regarding how knowledge engineering works in reality. Author

N89-19903# Carnegie-Mellon Univ., Pittsburgh, PA. Software Engineering Inst.
ISTAR EVALUATION Final Technical Report
MARC H. GRAHAM and DANIEL H. MILLER Jul. 1988 212 p
(Contract F19628-85-C-0003)

(AD-A201345; CMU/SEI-88-TR-3; ESD-TR-88-004) Avail: NTIS HC A10/MF A02 CSCL 12/6

ISTAR is a software development and project management environment that integrates management and technical development activities. It is based on the contract model, whose primary objective is that every individual in the organization know what is expected of him or her. To accomplish this, the relationships among the individuals of the organization are modeled as contracts. Each contract has a specification of the work to be performed under it, a person to whom it has been assigned, and a person for whom the work is being done. Chapter 2 describes the contract model both as a project management structure and as a data storage structure. It was found that the emphasis on project hygiene leads to a strict separation of user data spaces which causes excess data storage requirements and data movement operations. This, in turn, may make data sharing and cooperative work more difficult. ISTAR's user interface is also described in Chapter 2. That interface has a high degree of consistency because all user interaction is mediated through Imperial Software's proprietary editor, E, which is window- and menu-oriented. Chapter 3, which forms the bulk of the report, deals with the functional areas (that is, those tool sets supplied with ISTAR) which were of most interest to us. The remaining tool sets are described in Chapter 4. GRA

N89-21576# Massachusetts Inst. of Tech., Cambridge. Microsystems Research Center.

COMPUTER-AIDED FABRICATION SYSTEM IMPLEMENTATION Semiannual Technical Report, 1 Oct. 1987 - 31 Mar. 1988

PAUL PENFIELD, JR. 31 Mar. 1988 31 p

(Contract N00014-85-K-0213)

(AD-A203651) Avail: NTIS HC A03/MF A01 CSCL 12/6

The purpose of the work reported on here is to design, develop, implement, and deploy information management systems to aid in the fabrication of integrated circuits, particularly in the context of flexible manufacturing. The work includes the development of a hardware-software system, named CAFE, and the support of this program and its use in the MIT Integrated Circuits Laboratory. CAFE should support both manufacturing of ICs and the design of processes, so part of the effort is directed toward the development of a suitable process-development environment. Other projects are concerned with equipment and mechanical-property models and scheduling. GRA

N89-22356# Mitre Corp., Bedford, MA.

LINK PERFORMANCE DATA MANAGEMENT AND ANALYSIS SYSTEM USERS MANUAL Final Report

GABRIEL R. ELKIN Dec. 1988 189 p

(Contract F19628-86-C-0001)

(AD-A203605; MTR-10450; ESD-TR-88-283) Avail: NTIS HC A09/MF A01 CSCL 12/7

The Digital European Backbone (DEB) Link Performance Data Management and Analysis System (LMAS) performs reduction and analysis of the data acquired by the DEB Data Collection System (DCS). The data collection by DCS, called Field Data, is stored on magnetic tapes (Field Tapes), and consists if Received Signal Level (RSL) and Deep Fade statistics. LMAS allows several months of Field Data from one side of a link to be merged onto a Summary Tape. Using the Summary Tape database, LMAS provides the capability to plot and report several statistics for a variety of time periods. This paper serves as a guide for users of LMAS software and as a reference on the structure of the database. GRA

N89-22524# South Dakota Univ., Vermillion. Human Factors Lab.

MENUING AND SCROLLING AS ALTERNATIVE INFORMATION MANAGEMENT TECHNIQUES Interim Report, Feb. - Aug. 1986

S. S. OSGOOD Feb. 1988 92 p

(Contract N66001-85-C-0253)

(AD-A203029; NOSC/TD-1216) Avail: NTIS HC A05/MF A01 CSCL 12/5

An experiment was conducted to evaluate menuing and scrolling as alternative information management techniques. A menu structure (4-3) and three scrolling methods, line-by-line, half-screen, were tested. Level of goal word familiarity and size of display window were also examined. The task consisted of locating a target goal word with one of the four access methods. A touch tablet was used to interact with the computer system. Members of a single set of 64 words, 32 unfamiliar, served as goal words in all conditions. Performance data were collected from 48 subjects. Each subject received both word familiarity levels. Access method and window size were between-subjects variables. Results of an analysis of variance on mean total task time revealed significant access method, word familiarity, and access method by word familiarity interaction effects. Line-by-line scrolling was fastest, followed by full-screen scrolling, half-screen scrolling, and menuing. Separate analyses of variances were conducted on total task time for familiar and unfamiliar word sets. The fastest condition depended on the familiarity level of the goal word, but not on window size. When the goal words was familiar, menuing was fastest, followed by line-by-line, full screen, and half-screen scrolling. For unfamiliar goal words, line-by-line scrolling was fastest, followed by full-screen scrolling, half-screen scrolling, and menuing. GRA

N89-25773*# Research Inst. for Advanced Computer Science, Moffett Field, CA.

PERFORMANCE ISSUES IN MANAGEMENT OF THE SPACE STATION INFORMATION SYSTEM

MARJORY J. JOHNSON Sep. 1988 22 p Revised

(Contract NCC2-387)

(NASA-CR-185409; NAS 1.26:185409; RIACS-TR-88.22) Avail: NTIS HC A03/MF A01 CSCL 05/2

The onboard segment of the Space Station Information System (SSIS), called the Data Management System (DMS), will consist of a Fiber Distributed Data Interface (FDDI) token-ring network. The performance of the DMS in scenarios involving two kinds of network management is analyzed. In the first scenario, how the transmission of routine management messages impacts performance of the DMS is examined. In the second scenario, techniques for ensuring low latency of real-time control messages in an emergency are examined. Author

N89-26413# Virginia Univ., Charlottesville. Dept. of Computer Science.

IMPLEMENTATION OF A HYPERCUBE DATABASE SYSTEM Annual Report, Jul. 1988 - Feb. 1989

J. L. PFALTZ, S. H. SON, and J. C. FRENCH Mar. 1989 31 p

(Contract DE-FG05-88ER-25063)

(DE89-010474; DOE/ER-25063/1; UVA-527387/CS89/101)

Avail: NTIS HC A03/MF A01

At that time the principal investigators had already been working on the development of a database interface that would be appropriate for a hypercube implementation. However, the predominant thrust of that research had been towards developing a semantic data model which has been traditionally viewed as more appropriate for expert and artificial reasoning systems. We realized at that time that such a database implementation would be incomplete unless it also had a full capability for representing and accessing scientific data, by which we commonly mean array data. To support one kind of data without an equivalent capability of supporting all kinds of data would be futile. Still, it required this grant to direct a significant portion of our energies towards the representation of scientific data. In this report, we will concentrate primarily on our efforts to represent array types of data although it can not be entirely separated from our overall goal of representing all types of data in new ways that are particularly appropriate to a parallel processing environment. DOE

N89-26602*# Boeing Aerospace Co., Seattle, WA. Advanced Technology Center.

NATURAL LANGUAGE PROCESSING AND ADVANCED INFORMATION MANAGEMENT

JAMES E. HOARD *In* NASA. Goddard Space Flight Center, The 1989 Goddard Conference on Space Applications of Artificial

Intelligence p 301-315 Apr. 1989
Avail: NTIS HC A17/MF A03 CSCL 09/2

Integrating diverse information sources and application software in a principled and general manner will require a very capable advanced information management (AIM) system. In particular, such a system will need a comprehensive addressing scheme to locate the material in its docuverse. It will also need a natural language processing (NLP) system of great sophistication. It seems that the NLP system must serve three functions. First, it provides an natural language interface (NLI) for the users. Second, it serves as the core component that understands and makes use of the real-world interpretations (RWIs) contained in the docuverse. Third, it enables the reasoning specialists (RSs) to arrive at conclusions that can be transformed into procedures that will satisfy the users' requests. The best candidate for an intelligent agent that can satisfactorily make use of RSs and transform documents (TDs) appears to be an object oriented data base (OODB). OODBs have, apparently, an inherent capacity to use the large numbers of RSs and TDs that will be required by an AIM system and an inherent capacity to use them in an effective way. Author

N89-27261# Environmental Protection Agency, Las Vegas, NV. Environmental Monitoring Systems Lab.
GEO-EAS (GEOSTATISTICAL ENVIRONMENTAL ASSESSMENT SOFTWARE) USER'S GUIDE
EVAN J. ENGLUND and ALLEN R. SPARKS (Computer Sciences Corp., Las Vegas, NV.) Sep. 1988 182 p
(Contract EPA-68-01-7325)
(PB89-151252; EPA/600/4-88/033A; EPA/SW/DK-89/019A)
Avail: NTIS HC A09/MF A01 CSCL 13/2

The installation and use of the Geo-EAS (Geostatistical Environmental Assessment Software) software package on an IBM-PC compatible computer system are described. A detailed example is provided showing how to use the software to conduct a geostatistical analysis of a data set. Thirteen Geo-EAS programs are documented. The principal functions of the package are the production of 2-dimensional grids and contour maps of interpolated (kriged) estimates from sample data. Other functions include data preparation, data maps, univariate statistics, scatter plots/linear regression, and variogram computation and model fitting. Extensive use of screen graphics such as maps, histograms, scatter plots and variograms help the user search for patterns, correlations, and problems in a data set. Data maps, contour maps, and scatter plots can be plotted on an HP compatible pen plotter. Individual programs can be run independently; the statistics and graphics routines may prove useful even when a full geostatistical study is not appropriate. GRA

N89-27590# Economic Systems Analysis, Inc., Oak Ridge, TN.
TECHNOLOGY MASTER LIST DATA BASE MANAGEMENT SYSTEM, USER'S MANUAL
JEANNE YATES RIMPO and MARLENE J. OWENS Sep. 1988 111 p
(Contract GRI-5088-450-1667)
(PB89-177802; GRI-88/0249) Avail: NTIS HC A06/MF A01 CSCL 05/2

In order to track the movement of Gas Research Institute (GRI) projects from the drawing-board concept to commercialized product, GRI developed a Master List of these technologies and research applications. An interactive data base management program (titled WIN) was developed to permit manipulation and updating of the Master List data base. The user's manual provides information on using this data base management program, including record management (adding, editing, deleting, and moving records), report generation (selecting, sorting, and printing), and data base maintenance. The system is designed to be used with the dBase III Plus software on IBM or compatible personal computers. Author

N89-27597# Sandia National Labs., Albuquerque, NM. Organic Materials Div.
MANAGEMENT INFORMATION DATABASE SYSTEM
NANCY L. LEISHMAN May 1989 34 p
(Contract DE-AC04-76DP-00789)
(DE89-014595; SAND-88-3439) Avail: NTIS HC A03/MF A01

This is a description of a computerized database tool for use by operational management. The Management Information Database System was created to more efficiently maintain the information needed by managers for time and material cost accounting and resource scheduling. Reports produced reflect the current status of assignments and balances of F-orders. DOE

N89-28440*# George Washington Univ., Washington, DC.
DATA BASE DEVELOPMENT AND RESEARCH AND EDITORIAL SUPPORT Final Report, 17 Apr. 1978 - 30 Jun. 1988
30 Jun. 1988 100 p
(Contract NASW-3165)
(NASA-CR-183249; NAS 1.26:183249) Avail: NTIS HC A05/MF A01 CSCL 05/2

The Life Sciences Bibliographic Data Base was created in 1981 and subsequently expanded. A systematic, professional system was developed to collect, organize, and disseminate information about scientific publications resulting from research. The data base consists of bibliographic information and hard copies of all research papers published by Life Sciences-supported investigators. Technical improvements were instituted in the database. To minimize costs, take advantage of advances in personal computer technology, and achieve maximum flexibility and control, the data base was transferred from the JSC computer to personal computers at George Washington University (GWU). GWU also performed a range of related activities such as conducting in-depth searches on a variety of subjects, retrieving scientific literature, preparing presentations, summarizing research progress, answering correspondence requiring reference support, and providing writing and editorial support. Author

N89-28442# Naval Postgraduate School, Monterey, CA.
AN IMPLEMENTATION OF A DATA DEFINITION FACILITY FOR THE GRAPHICS LANGUAGE FOR DATABASE M.S. Thesis
MICHAEL L. WILLIAMSON Dec. 1988 89 p
(AD-A207380) Avail: NTIS HC A05/MF A01 CSCL 12/5

This research is an implementation of the data definition facility for the Graphics Language for Database (GLAD). GLAD is a graphics-oriented database management system which is primarily concerned with ease of learning and efficiency of use. The system uses an object-relationship approach to data base design. Entities of the database are represented graphically as objects. With this method, users can visualize the schema of the database and can quickly comprehend how the entities relate. Every effort was made to design GLAD so that a new user can quickly learn to create and manipulate a database without the need of a dedicated database administrator. GRA

N89-71121* Computer Sciences Corp., Silver Spring, MD.
THE SOFTWARE ENGINEERING LABORATORY Final Report
DAVID N. CARD and F. E. MCGARRY (National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.) Feb. 1982 122 p Previously announced in IAA as A89-71030
(Contract NAS5-24300)
(NASA-CR-183455; NAS 1.26:183455; CSC/TM-82/6033; SEL-81-104) Avail: NTIS

N89-71278* Southwest Research Inst., San Antonio, TX. Dept. of Civil Engineering and Energetic Systems.
ADRS: AUTOMATED DATA REDUCTION SYSTEM Final Report
D. K. OKELLEY, S. RUNNELS, and J. P. RIEGEL, III 12 May 1988 442 p
(Contract NAS5-28283; SWRI PROJ. 06-8347-001)
(NASA-CR-183438; NAS 1.26:183438) Avail: NTIS

N89-71336* Institute for Computer Applications in Science and Engineering, Hampton, VA.
PERFORMANCE OF A DATA BASE MANAGEMENT SYSTEM WITH PARTIALLY LOCKED VIRTUAL BUFFERS
RICHARD S. BRICE (George Washington Univ., Washington, DC.) and STEPHEN W. SHERMAN 27 Feb. 1976 17 p Prepared in cooperation with Houston Univ., TX
(Contract NAS1-14101; NGR-09-010-078)
(NASA-CR-185729; ICASE-76-6; NAS 1.26:185729) Avail: NTIS

STI AND LIBRARIES

Management of scientific and technical information so that it has maximum impact on the R&D process — carried directly to the researcher or channeled through the library — has perplexed those organizations that carry on high technology activities. Conceptually, STI can be considered within IRM, wherever it may fit in the management structure.

A84-44092
INFORMATION RETRIEVAL STRATEGIES IN A FILE-SEARCH ENVIRONMENT
J. ELKERTON and R. C. WILLIGES (Virginia Polytechnic Institute and State University, Blacksburg, VA) Human Factors (ISSN 0018-7208), vol. 26, April 1984, p. 171-184. refs
(Contract N00014-81-K-0143; NR PROJECT SRO-101)
Copyright

The investigation represents an exploration of search strategies in an information-retrieval task. The task environment consisted of five search procedures: scrolling, paging, string search, absolute line movement, and relative line movement. Independent variables included user, task, and editor characteristics. The user variable was previous interactive computing experience (novice or expert). The task variables were file type (data or text), file length (short or long), and target type (embedded, nonembedded, or repeated). The editor variable was window size (1, 7, 13, or 19 lines). The results of the 2 x 2 x 2 x 3 x 4 mixed-factor experiment indicated that subject experience, file length, target type, and window size, as well as an interaction between subject experience and file length, were the salient factors of file search. Large differences in novice and expert search strategies were also discovered. Most importantly, the investigation revealed the need for adaptive interfaces that can alter in response to a user's style. Author

A84-45547* National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
THE FUNCTION OF REPORT COMPONENTS IN THE SCREENING AND READING OF TECHNICAL REPORTS
T. E. PINELLI, V. M. CORDLE (NASA, Langley Research Center, Hampton, VA), and R. F. VONDRAN (Catholic University of America, Washington, DC) Journal of Technical Writing and Communication (ISSN 0047-2816), vol. 14, no. 2, 1984, p. 87-94. refs
Copyright

A reader preference survey of engineers and scientists at the NASA Langley Research Center and in three professional/technical societies was conducted to determine the opinions of report users and producers concerning the format (organization) of NASA technical reports and the usage of technical report components. The survey questionnaire contained fourteen questions covering twelve survey topics. This article reports the findings of two survey topics: the components initially reviewed or read to determine whether to read a report in its entirety and the order in which report components are read. Author

A84-45571*
COST CONSIDERATIONS IN DATABASE SELECTION - A COMPARISON OF DIALOG AND ESA/IRS
R. F. JACK (NASA, University of Kentucky Technology Applications Program, Lexington, KY) Online (ISSN 0146-5422), July 1984, p. 51-54.
(Contract NASW-3367)
Copyright

It is pointed out that there are many factors which affect the decision-making process in determining which databases should be selected for conducting the online search on a given topic. In many cases, however, the major consideration will be related to cost. The present investigation is concerned with a comparison of the costs involved in making use of DIALOG and the European Space Agency's Information Retrieval Service (ESA/IRS). The two services are very comparable in many respects. Attention is given to pricing structure, telecommunications, the number of databases, prints, time requirements, a table listing online costs for DIALOG and ESA/IRS, and differences in mounting databases. It is found that ESA/IRS is competitively priced when compared to DIALOG, and, despite occasionally higher telecommunications costs, may be even more economical to use in some cases. G.R.

A85-24514* National Aeronautics and Space Administration, Washington, DC.
IDIOT SHEETS - PREPARING AND USING DATABASE GUIDE SHEETS
R. F. JACK (NASA/University of Kentucky, Technology Applications Program, Lexington, KY) Database (ISSN 0162-4105), vol. 7, Dec. 1984, p. 76-82.
(Contract NASW-3367)
Copyright

In connection with the utilization of databases, problems can arise with respect to the understanding or evaluation of the provided information. Database guide sheets can be an important aid for overcoming these problems. A number of systems are already sufficiently documented by guide sheets, while other systems do not have guide sheets with adequate descriptive information. Details regarding database guide sheets are discussed, taking into account the type of descriptive information provided, the sample online record, and access points and other related functions for searching the database. Attention is given to cases when a guide sheet should be made, details regarding the preparation of such a sheet, the importance of neatness, and important points which should be kept in mind when guide sheets are being prepared. G.R.

A85-24549*
AN INTERMEDIARY'S PERSPECTIVE OF ONLINE DATABASES FOR LOCAL GOVERNMENTS
R. F. JACK (NASA/University of Kentucky, Technology Applications Program, Lexington, KY) IN: National Online Meeting, New York, NY, April 10-12, 1984, Proceedings. Medford, NJ, Learned Information, Inc., 1984, p. 115-123.
(Contract NASW-3367)
Copyright

Numerous public administration studies have indicated that local government agencies for a variety of reasons lack access to comprehensive information resources; furthermore, such entities are often unwilling or unable to share information regarding their own problem-solving innovations. The NASA/University of Kentucky Technology Applications Program devotes a considerable effort to providing scientific and technical information and assistance to local agencies, relying on its access to over 500 distinct online databases offered by 20 hosts. The author presents a subjective assessment, based on his own experiences, of several databases which may prove useful in obtaining information for this particular end-user community. Author

A86-40659* NASA Scientific and Technical Information Facility, Baltimore-Washington International Airport, MD.
'MEATBALL SEARCHING' - THE ADVERSARIAL APPROACH TO ONLINE INFORMATION RETRIEVAL
R. F. JACK (NASA, Scientific and Technical Information Facility, Baltimore, MD) Database (ISSN 0162-4105), vol. 8, Dec. 1985, p. 45-52. refs
(Contract NASW-3367)
Copyright

It is proposed that the different styles of online searching can

be described as either formal (highly precise) or informal with the needs of the client dictating which is most applicable at a particular moment. The background and personality of the searcher also come into play. Particular attention is focused on meatball searching which is a form of online searching characterized by deliberate vagueness. It requires generally comprehensive searches, often on unusual topics and with tight deadlines. It is most likely to occur in search centers serving many different disciplines and levels of client information sophistication. Various information needs are outlined as well as the laws of meatball searching and the adversarial approach. Traits and characteristics important to sucessful searching include: (1) concept analysis, (2) flexibility of thinking, (3) ability to think in synonyms and (4) anticipation of variant word forms and spellings. K.K.

A87-34522
COMPUTER ARCHITECTURE FOR A SURROGATE FILE TO A VERY LARGE DATA/KNOWLEDGE BASE
P. BRUCE BERRA, SOON MYOUNG CHUNG, and NABIL I. HACHEM (Syracuse University, NY) Computer (ISSN 0018-9162), vol. 20, March 1987, p. 25-32. refs
(Contract F30602-85-C-0008)
Copyright

Techniques are presented for managing a very large data/knowledge base to support multiple inference mechanisms for logic programming. The frequent requirement to resort to indexing on all fields of extensional database (EDB) facts presents a very serious management problem in that the index data may be larger than the EDB itself. This problem becomes even more serious in the case of very large data/knowledge bases (hundreds of gigabytes), because more hardware will be required to process and store the index data. In order to reduce the amount of index data considerably without losing generality, a surrogate file is formed which is a hashing transformation of the facts. Superimposed code words (CDW), concatenated code words (CCW), and transformed inverted lists (TIL) are possible structures for the surrogate file. Since these transformations are quite regular and compact, possible computer architectures are considered for the processing of the surrogate file. The use of associative memory methods, as well as a back-end system under development, are discussed in order to illustrate how nonsequential computer architectures can be used to advantage in solving this problem. Consideration is given to how one might perform relational operations on the surrogate file rather than on the full data. D.H.

A89-21812* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
AUTOMATED CATALOGING AND CHARACTERIZATION OF SPACE-DERIVED DATA
WILLIAM J. CAMPBELL (NASA, Goddard Space Flight Center, Greenbelt, MD), LARRY ROELOFS (Computer Technology Associates, Inc., McLean, VA), and MICHAEL GOLDBERG (Mitre Corp., McLean, VA) (NASA, 1988 Goddard Conference on Space Applications of Artificial Intelligence, Greenbelt, MD, May 24, 1988) Telematics and Informatics (ISSN 0736-5853), vol. 5, no. 3, 1988, p. 279-288. Previously announced in STAR as N88-30354. refs
Copyright

One of the most significant technical issues that NASA must address and resolve is the problem of managing the enormous amounts of scientific and engineering data that will be generated by the next generation of remote sensing systems such as the Hubble Space Telescope (HST) and the Earth Observing System (EOS). The amount of data these sensors are expected to produce will be orders of magnitude greater than NASA has ever experienced. Consequently, new solutions must be developed for managing, accessing, and automatically inputting the data into a database in some expressive fashion that will provide a meaningful understanding and effective utilization of this data in a multidisciplinary environment. Presently, scientific data provided by satellites and other sources are processed, cataloged, and archived according to narrow mission or project-specific requirements with little regard to the semantics of the overall research. Scientists therefore lack knowledge of or access to potentially valuable data outside their own field. What is needed is an innovative approach that will allow collected data to be automatically cataloged, characterized, and managed in a domain-community. A concept and design approach that employs expert system-based knowledge controllers combined with advanced spatial database systems and graphical data structures is discussed. Author

A89-25618#
TECHNOLOGY ADVANCES FOR INFORMATION ACCESS - PROSPECTS AND IMPACT
ROGER K. SUMMIT (Dialog Information Services, Inc., Palo Alto, CA) AIAA, Aerospace Sciences Meeting, 27th, Reno, NV, Jan. 9-12, 1989. 8 p. refs
(AIAA PAPER 89-0849) Copyright

This paper traces the history of online information retrieval, with emphasis on the manner in which technological advances stimulated the development of the online industry in general, and the DIALOG Information Retrieval Service in particular. The current technology employed by Dialog is examined, as are applications of that technology to information searching in the aerospace/defense industry. Continuing progress in online and CDROM (Compact Disk, Read Only Memory) information technology is reviewed, prospects for future development are analyzed, and the impact of that development on the online industry is considered. Author

A89-25619#
DOD INFORMATION ANALYSIS CENTERS - THEIR RESOURCES AND AVAILABILITY
PAUL M. KLINEFELTER (DOD, Defense Technical Information Center, Alexandria, VA) AIAA, Aerospace Sciences Meeting, 27th, Reno, NV, Jan. 9-12, 1989. 12 p.
(AIAA PAPER 89-0850)

From their inception after World War II and particularly since their recognition and official sponsorship by the Deprtment of Defense (DOD) in 1965, information analysis centers have proved their worth as dependable sources of subject expertise in support of DOD research and engineering projects and policies. They provide state-of-the-art answers and evaluated supporting data within their respective areas of subject specialization, complementing the technical document reference and access furnished by libraries and information centers. Author

A89-25620#
HOW AN ENGINEER ACQUIRES AND USES INFORMATION THROUGH THE DIALOG SYSTEM
PAUL ZARCHAN (Charles Stark Draper Laboratory, Inc., Cambridge, MA) AIAA, Aerospace Sciences Meeting, 27th, Reno, NV, Jan. 9-12, 1989. 9 p.
(AIAA PAPER 89-0851) Copyright

The use of the DIALOG Information Retrieval Service in the daily work of an aerospace engineer is discussed. Consideration is given to the technical aspects and cost of using the system. The various types of data bases included in the DIALOG system are discussed, focusing on data bases which are useful to engineers. Sample searches using the Aerospace DataBase are presented to illustrate the operation of research oriented data bases. Examples are given for other DIALOG data bases which provide national, international, business, and technological news. Other examples using the DIALOG system include searching resumes when recruiting new employees and obtaining information on the research and business activities of prominent persons. It is concluded that operation of the DIALOG system on a daily basis provides an extensive amount of information pertinent to engineers. R.B.

A89-27235
A LIBRARY COLLECTION OF SOFTWARE DOCUMENTATION SPECIFIC TO ASTRONOMICAL DATA REDUCTION
CAROL RHODES, MICHAEL KURTZ, and JOYCE REY-WATSON (Harvard-Smithsonian Center for Astrophysics, Cambridge, MA) IN: Astronomy from large databases: Scientific objectives and

methodological approaches; Proceedings of the Conference, Garching, Federal Republic of Germany, Oct. 12-14, 1987. Garching, Federal Republic of Germany, European Southern Observatory, 1988, p. 459-464.
Copyright

A library collection of software documentation used in astronomical data reduction is being created. In this paper, objectives in establishing this collection are discussed. A list of acquired documentation is presented with brief descriptions of the software and the hardware required. The collection will be cataloged and available for interlibrary loan through the Smithsonian Institution Library. Instructions on accessing this collection are included. The project is summarized, with special consideration given to the future directions of this collection. Author

A89-45650* NASA Scientific and Technical Information Facility, Baltimore-Washington International Airport, MD.
SEARCHING THE PASCAL DATABASE - A USER'S PERSPECTIVE
ROBERT F. JACK (NASA, Scientific and Technical Information Facility, Baltimore, MD) Database (ISSN 0162-4105), vol. 12, Aug. 1989, p. 86-91.
(Contract NASW-4070)
Copyright

The operation of PASCAL, a bibliographic data base covering broad subject areas in science and technology, is discussed. The data base includes information from about 1973 to the present, including topics in engineering, chemistry, physics, earth science, environmental science, biology, psychology, and medicine. Data from 1986 to the present may be searched using DIALOG. The procedures and classification codes for searching PASCAL are presented. Examples of citations retrieved from the data base are given and suggestions are made concerning when to use PASCAL. R.B.

N84-11059# Henderson (Madeline M.), Bethesda, MD.
COMPILATION OF COOPERATIVE DATA ELEMENT DICTIONARY OF FIVE FEDERAL AGENCIES' SYSTEMS FOR PROCESSING OF TECHNICAL REPORT LITERATURE
M. M. HENDERSON 1 Mar. 1983 78 p
(AD-A130797; PB83-193771) Avail: NTIS HC A05/MF A01 CSCL 05/2

The data element dictionary project consisted of the compilation of a dictionary encompassing all of the data elements used in the major systems for handling technical reports; the systems involved are those of the Department of Defense Technical Information Center (DTIC), Department of Energy Technical Information Center (DOE/TIC), the National Aeronautics and Space Administration Scientific and Technical Information Facility (NASA/STIF), the National Technical Information Service (NTIS), and the Government Printing Office (GPO). All those elements, both substantive and housekeeping types, used in processing technical reports in each system are included in the compilation; each record contains the element's definition, rules for use, the tags or indicators used internally, and those used externally for information interchange. Author (GRA)

N84-11061# King Research, Inc., Rockville, MD.
THE USE AND VALUE OF DEFENSE TECHNICAL INFORMATION CENTER PRODUCTS AND SERVICES
N. K. RODERER, D. W. KING, and S. E. BROUARD Jun. 1983 115 p
(AD-A130805) Avail: NTIS HC A06/MF A01 CSCL 05/2

This study describes the use and value of the major information products and services provided by the Defense Technical Information Center (DTIC). The products and services considered include technical report distribution on an on demand-basis and through the Automatic Document Distribution (ADD) program; secondary information dissemination through online searching of the Technical Reports (TR) data base, Current Awareness Bibliographies (CAB), and Technical Abstract Bulletins (TAB); and provision of management information from three management data banks. The amount and kinds of use of each of these products and services is addressed, as is the value associated with use. GRA

N84-15836# Oak Ridge Gaseous Diffusion Plant, TN.
COMPUTER-OUTPUT MICROFICHE (COM) ON THE OAK RIDGE COMPUTER NETWORK
F. M. OHARA, JR. Aug. 1983 84 p refs
(Contract W-7405-ENG-26)
(DE84-002422; K/CSD-INF-83-20) Avail: NTIS HC A05/MF A01

The computer network at the Department of Energy research and production plants in Oak Ridge has the capability of producing computer output microfiche on centralized facilities. Different computers in the network have different ways to access this output capability. These different ways are: the output class, the cataloged procedure PCOM, the utility program LCOM, the MIC file COM, and user written macros. The uses of these different methods are explained and described in this manuals, and examples of their use are presented. DOE

N84-23406 Maryland Univ., College Park.
STRATEGIES AND MECHANISMS FOR THE DIFFUSION OF SCIENTIFIC AND TECHNICAL INFORMATION: A COMPARATIVE STUDY Ph.D. Thesis
Z. M. P. D. S. FRANCA 1983 174 p
Avail: Univ. Microfilms Order No. DA8402558

Existing strategies and mechanisms for the diffusion of scientific and technical information through an analysis of selected doctoral dissertations are analyzed. The major results of the study were as follows: (1) On the basis of Lewin's three-phase paradigm for planned change, seven types of information strategy were identified: Delivery, Information Network, Adoption-Diffusion, Decision-making, Direct Foreign Investment, Research, Development and Diffusion, and Social Behavioral; (2) A wide variety of mechanisms were noted; (3) Chi-square testing showed that personal mechanisms were significantly more effective than other types of mechanism; (4) A model was constructed which reflected the variation in communication sources and channels as well as the role of social cultural pressures and decision-making functions at all three levels of information dissemination. This model is applied to the communication process between developed nations to end-users in less developed countries. Dissert. Abstr.

N84-25369# Lawrence Livermore National Lab., CA.
DISPLAY UNITS FOR ONLINE PASSAGE RETRIEVAL: A COMPARATIVE ANALYSIS
T. R. GIRILL Sep. 1983 24 p refs Presented at the 31st Intern. Tech. Communication Conf., Seattle, 1 May 1984 Submitted for publication
(Contract W-7405-ENG-48)
(DE84-001004; UCRL-89740; CONF-840560-1) Avail: NTIS HC A03/MF A01

Several commercial and governmental computer services now let users retrieve passages online from the full text of books, statutes, or journal articles. The display units in which the test is packaged, however, vary greatly between systems, and these units heavily influence the quality of service. Four reader problems concerning printed books - finding where subjects are discussed, assessing how important each treatment is, linking scattered treatments of the same subject, and exploiting the test's organization - all have standard solutions involving widespread, time tested indexing strategies. All four problems reappear in computerized passage retrieval systems. But, in each case, structural display units (those based on format) prove much less successful then functional display units (based on content) in permitting the traditional solutions to work online too. Hence, functional units consistently support better access to online information than do structural units. DOE

N84-29798# Logistics Management Inst., Washington, DC.
LOCAL AUTOMATION MODEL: SYSTEM SPECIFICATION
W. P. HAMILTON, III, R. W. HARTT, and D. J. OCONNOR Mar. 1984 135 p

(Contract MDA903-81-C-0166)
(AD-A141503; LMI-DL401) Avail: NTIS HC A07/MF A01
CSCL 05/2

This document contains a system specification for the Local Automation Model (LAM). The LAM will provide DoD Technical Libraries in the Shared Bibliographic Input Network a local automated information system to improve the management of DoD bibliographic information. The proposed system will replace the existing manual and batch procedures by technical library personnel. The system will provide automated storage of local bibliographic files and access to both local files and the DTIC Technical Reports Data base. Contained in this system specification are a summary of the system characteristics and requirements, a description of the system operating environment (including equipment, software, interfaces, and security) and a discussion of the design details (including general operating procedures, system logic flow, system data, and program descriptions).

Author (GRA)

N84-32277 Illinois Univ., Urbana.
PAGE INDEXING FOR TEXTUAL INFORMATION RETRIEVAL SYSTEMS Ph.D. Thesis
P. A. EMRATH 1983 150 p
Avail: Univ. Microfilms Order No. DA8409916

A number of applications exist for systems which can store and interactively retrieve from very large natural language textual databases. Conventional approaches to the design of such systems are discussed. The notion of page indexing is introduced as a scheme for doing information retrieval from natural language full-text databases. The structure of a page indexed database is described and the algorithms needed to do retrieval using the page index are presented. Some characteristics of page indexed text are analyzed and measured in order to estimate the size of the page index, and to show how the size of the index is related to the page size. One of the advantages of the page indexing scheme is the ease with which such a system can be analyzed. This analysis is based on characteristics of the hardware used to implement the system and on characteristics of queries. Finally, three hypothetical systems are proposed and analyzed. These systems range from a microprocessor for a data base of 250 megabytes to a large computer system employing multiple special purpose processors for a database of 50 gigabytes.

Dissert. Abstr.

N84-33283# National Commission on Libraries and Information Science, Washington, DC.
A DECADE OF ACCOMPLISHMENT Annual Report, 1980 - 1981
30 Apr. 1982 114 p
(ISSN-0091-2972; AR-10) Avail: NTIS HC A06/MF A01

Accomplishments of the National Commission of Libraries and Information Science during its first ten years are summarized. Major activities of FY-81 include completion of a landmark study to identify the proper roles of the public sector, particularly the Federal government, and the private sector in disseminating information; participation in implementing the Paperwork Reduction Act, and support of the Intermountain Community Learning/Information Center Project.

A.R.H.

N85-12780 Indiana Univ., Bloomington.
INFORMATION PROCESSING FOR BETTER UTILIZATION: ASSESSING THE CLER MODEL AS ORGANIZER FOR INNOVATION DIFFUSION AND PLANNED CHANGE INFORMATION REPORTED IN SELECTED STUDIES IN THE ERIC SYSTEM Ph.D. Thesis
G. W. BROWN 1984 440 p
Avail: Univ. Microfilms Order No. DA8417175

The impact on knowledge utilization of a research review organized according to the CLER model of planned change was assessed. An examination of the services performed by eleven available education databases revealed at least two significant obstacles to knowledge use that are subject to amelioration: (1) appropriate information is often difficult to locate, and (2) even when retrieved, information is often difficult to interpret. The premises undergirding the study were that knowledge utilization would increase if (1) knowledge was processed rather than merely abstracted, (2) the processed knowledge was organized according to a general theory appropriate to an area of specialization, and (3) individual information items were classified according to the general theory. A research review was conducted using 50 innovation diffusion and planned change documents available through the Educational Resources Information Center (ERIC) system. The categories for the review, as well as the descriptive terminology, were derived from the concepts and constructs of the CLER model. The usefulness of such a theoretically-based organization of information was assessed by a panel.

Dissert. Abstr.

N85-12798# Drexel Univ., Philadelphia, PA. Coll. of Information Studies.
EVALUATION OF THE NATIONAL LIBRARY OF MEDICINE'S PROGRAMS IN THE MEDICAL BEHAVIOR SCIENCES. ONLINE SEARCHERS' REACTIONS TO DATABASE AND VENDOR CAPABILITIES IN THE MEDICAL BEHAVIORAL SCIENCES (MBS), STUDY 4 Final Report
M. C. DROTT, K. W. MCCLAIN, B. A. RAPP, V. A. MUSICO, and B. C. GRIFFITH Apr. 1984 20 p refs 6 Vol.
(Contract NO1-LM-23510)
(PB84-230523; NLM-82/302/4) Avail: NTIS HC A03/MF A01; also available in set of 6 reports HC E99 as PB84-230473
CSCL 05/11

This study attempts to gather data which will assist in the design of search capabilities, command structures and new user services for host systems and databases. The source of this data was the record of two focused discussion groups. The comments made by these groups are organized and briefly summarized.

GRA

N85-20938# Lawrence Livermore National Lab., CA. Technology Information System.
POST-PROCESSING OF BIBLIOGRAPHIC CITATIONS FROM DOE/RECON, NASA/RECON, AND DOD/DROLS
W. A. BOLLINGER, V. E. HAMPEL, I. HARRISON, and T. P. MURPHY Aug. 1984 17 p refs Presented at the 8th Intern. Online Inform. Meeting, London, 4-6 Dec. 1984
(Contract W-7405-ENG-48)
(DE85-000617; UCRL-89995-REV-1; CONF-841243-REV-1)
Avail: NTIS HC A03/MF A01

An interactive, self guided program for the joint post processing of bibliographic citations from the federal information centers of the Department of Energy (DOE), the Department of Defense (DOD), and the National Aeronautics and Space Administration (NASA) was developed. Users are individually authorized for automated access to specific information centers, and use standard commands for the downloading, compilation, and online review of citations in a common format. Previously reported post processing capabilities were expanded, permitting: (1) online citation review, categorization, and addition of new data elements; (2) disassembly and reassembly of citations; (3) statistical analysis of data field contents; (4) cross correlation of data field contents; and (5) concordance generation. The new two pass interpreter for the post processing program permits the transformation of abbreviated data field names into English names preferred by each agency, the statistical analysis of the density and completeness of data field in selected sets of bibliographic citations, the elimination of redundant citations, and trend analysis. The latter is a powerful tool for the exploration of time dependent characteristics in a particular field of research, of an organization, or for an author. Graphical displays of publication rates as a function of time and the normalized statistics of terms used in the description of the work, can be used to signal new directions of ongoing research and the intensity of its support.

DOE

N85-22260# Battelle Columbus Labs., OH.
EVALUATION OF THE VOCABULARY SWITCHING SYSTEMS Final Report, 1 Oct. 1979 - 31 Oct. 1984

R. NIEHOFF and G. MACK Aug. 1984 205 p refs Submitted for publication
(Contract NSF IST-79-11190; NSF IST-81-11497)
(PB85-127157) Avail: NTIS HC A10/MF A02 CSCL 05/2

The Vocabulary Switching System (VSS) is an experimental system designed to enhance search strategies and ultimately retrieval performance for those who use online bibliographic data bases. VSS contains 15 indexing and retrieval vocabularies from 12 different suppliers. By fully integrating these vocabularies into common VSS files the VSS user has access to about 315 thousand possible search terms. VSS assists users with free-text or controlled-vocabulary searches and single or multiple data base searches. This report describes research efforts undertaken to: (1) modify and expand VSS from an earlier more primitive version, and (2) evaluate VSS in end-user and intermediary communities in real-life situations. Author (GRA)

N85-27747 Illinois Univ., Urbana-Champaign.
RETRIEVAL PERFORMANCE IN A FULL TEXT JOURNAL ARTICLE DATABASE Ph.D. Thesis
C. TENOPIR 1984 264 p
Avail: University Microfilms Order No. DA8502315

It is often assumed that the availability of the full text of journal articles for online searching will make abstracting and indexing obsolete and that search results with full text will be superior to the results of bibliographic searching. These assumptions were tested by comparing results from searching the full text of journal articles in the Harvard Business Review Online database on a commercial search system with the results from searching on the titles and the value-added fields of abstract and controlled vocabulary. There was a significant difference at the .05 level between the full text and other methods for total documents retrieved, recall ratio, and overlap and uniqueness of specific documents retrieved. Full text searching contributed a significantly greater number of documents, had a significantly higher recall, and contributed a significantly higher number of unique documents. Its precision ratio was lower than other search methods.
Dissert. Abstr.

N85-27749 Illinois Univ., Urbana-Champaign.
ACCESS PATH OPTIMIZATION FOR NETWORK DATABASE RETRIEVAL Ph.D. Thesis
H. H. CHEN 1984 116 p
Avail: University Microfilms Order No. DA8502102

In evaluating a query using a network database, the links need to either be followed or be saved. Two new data retrieval methods are presented so that the links are saved in a database relation for later use. The method proposed combine traditional relational and network retrieval methods. In many cases, these new methods show substantial performance improvement in evaluating queries using network databases CK84a. The proposed methods are useful for database retrieval from network databases as well as from relational databases implemented with links CK84b. A high-level query interface is usually provided to translate a user's queries into efficient network queries. The query optimization algorithms for such a system are presented in a stepwise fashion by beginning with finding an optimal access path for a given access tree using the proposed methods as well as the traditional method of database retrieval. Dissert. Abstr.

N85-27750 Illinois Univ., Urbana-Champaign.
DESIGN OF AN INTERFACE TO AN INFORMATION RETRIEVAL NETWORK Ph.D. Thesis
J. D. MENDOZA 1984 192 p
Avail: University Microfilms Order No. DA8502245

The use of computers for information retrieval has brought about a growth of databases (bibliographic, in particular) as well as an increase in the number of search service centers (SSCs) that make the databases accessible online. This thesis proposes an interface to these SSCs and databases to make the variabilities transparent to the user - an Automatic IRC. The Automatic IRC, aimed to be a full-service information center, provides the following services for the user: (1) assistance in the formation of the query; (2) assistance in the choice of relevant databases and location of SSC(s) that make the database(s) accessible at a low cost; (3) automatic dial-up and log-on to the SSCs and the databases; (4) translation of the user query into a format that can be processed by the SSC retrieval system; (5) post-processing of bibliographic citations from online searches (i.e., sorting, merging, eliminating duplicate citations and finishing the output); and (6) location, ordering and delivery of documents. Dissert. Abstr.

N85-35828# Computer Sciences Corp., Gulf Breeze, FL.
EPALIT: A DATA MANAGEMENT SYSTEM APPLIED TO THE CONTROL AND RETRIEVAL OF TECHNICAL REPORTS
S. M. MEANS 1985 20 p refs
(Contract EPA-68-01-6639-236)
(PB85-193068; EPA-600/D-85-085) Avail: NTIS HC A03/MF A01 CSCL 05/2

The EPALIT data management system is used by the EPA Environmental Research Laboratory, Gulf Breeze, FL, to preserve and manipulate information in text atabases. EPALIT provides the logical resources for data organization, analysis, and retrieval. It is completely interactive and permits natural language searching with full or truncated terms, imbedded word fragments, and Boolean search strings. The library has applied this system to the control and dissemination of its information resources. The Contribution Database, consisting of the laboratory's in-house and extramural publications, is the most sophisticated application to date. EPALIT's features are described in the context of this Contribution Database and its various report formats illustrated. GRA

N86-11078# R-K Research and System Design, Malibu, CA.
ANNOTATED BIBLIOGRAPHY OF PUBLICATIONS DEALING WITH OCCUPATIONAL HEALTH AND MEDICAL INFORMATION SYSTEMS, COST ANALYSIS PROCEDURES, EVALUATION METHODOLOGY AND RELATED LEGAL ISSUES
1984 43 p
(Contract N00014-84-C-0601)
(AD-A156650) Avail: NTIS HC A03/MF A01 CSCL 06/10

The purpose of this selective bibliography is to provide a sense of the scope of the literature relevant to the subject matter of interest in this project to test and evaluate the Navy Occupational Health Information Management System (NOHIMS). The intent has been to describe the contents of each reference in sufficient detail so that a decision could be made whether or not to obtain a copy of the complete article. Articles are taken from journals such as The New England Journal of Medicine, Proceedings of the Fifth Annual Symposium on Computer Applications in Medical Care, Journal of Occupational Medicine, Navy Lifeline and Science. Topics cover a variety of topics such as liability for personal injuries caused by defective medical computer programs, computers in medical care, mental health information systems, COSTAR, Environmental Health Systems, and Medical surveillance requirements. GRA

N86-12995# Army Cold Regions Research and Engineering Lab., Hanover, NH.
A USER'S GUIDE FOR THE BIBSORT PROGRAM FOR THE IBM-PC PERSONAL COMPUTER
T. KYRIAKAKIS and I. K. ISKANDAR Apr. 1985 66 p
(Contract DA PROJ. 4A1-61102-AT-24)
(AD-A157936; CRREL-SR-85-4) Avail: NTIS HC A04/MF A01 CSCL 09/2

This report is intended to provide the reader with step-by-step instructions on how to use the BIBSORT computer program on the IBM Personal Computer. THe program allows storage and retrieval of bibliographic data. The program has been tested on an IBM-XT, using DOS 1.1 or 2.1. The program requires a monitor and a printer. This user's guide discusses how to prepare diskettes to enter the data, how to name categories and files, how to open categories and files, and how to enter data. The guide also shows how to sort and store data, edit, delete, or append the data, and how to obtain a hard copy of the sorted data. Each data diskette can take up to 500 entries, assuming 512 characters per entry. A

section on how to change the program to fit specific needs is presented in Appendix A, and the program listing is in Appendix B. GRA

N86-15211# Defense Technical Information Center, Alexandria, VA.
INTEGRATED BIBLIOGRAPHIC INFORMATION SYSTEM: INTEGRATING RESOURCES BY INTEGRATING INFORMATION TECHNOLOGIES Final Report
G. A. COTTER and R. W. HARTT May 1985 10 p
(AD-A157700; DTIC/TR-85/8) Avail: NTIS HC A02/MF A01
CSCL 05/2

The Defense Technical Information Center (DTIC) is sponsoring the development of an integrated bibliographic information system. The prototype of this system, under development since April 1983, will be used to demonstrate the concept of an integrated library system combined with an intelligent gateway capable of querying and updating -- simultaneously -- more than one heterogeneous bibliographic data base (catalog). Queries and updates of any data base will be performed using a common command language, relieving the system user of the need to learn and master separate languages and procedures for each data base accessed. The development approach used, the information processing concepts and technologies investigated and selected for implementation in the prototype system, and the issues underpinning system implementation are described. GRA

N86-16155# Pacific Northwest Lab., Richland, WA.
ASSURANCE PROGRAM FOR REMEDIAL ACTION (APRA) MICROCOMPUTER-OPERATED BIBLIOGRAPHY MANAGEMENT SYSTEM
R. D. STENNER, D. K. WASHBURN, and D. H. DENHAM Jun. 1985 68 p
(Contract DE-AC06-76RL-01380)
(DE85-008763; PNL-5527) Avail: NTIS HC A04/MF A01

Pacific Northwest Laboratory (PNL) provided technical assistance to the Office of Operational Safety (OOS) in developing their Assurance Program for Remedial Action (APRA). The APRA Bibliography Management System (BMS), a microcomputer-operated system designed to file, locate and retrieve project-specific bibliographic data, was developed to manage the documentation associated with APRA. The BMS uses APRABASE, a PNL-developed computer program written in dBASE II language, which is designed to operate using the commercially available dBASE II database software. This document describes the APRABASE computer program, its associated subprograms, and the dBASE II APRA file. A User's Manual is also provided in the document. Although the BMS was designed to manage APRA-associated documents, it could be easily adapted for use in handling bibliographic data associated with any project. DOE

N86-17219# Allied Bendix Corp., Kansas City, MO.
LABORATORY TECHNICAL INFORMATION SYSTEM: ANALYSIS-PHASE
L. L. HOLLAND Aug. 1985 29 p
(Contract DE-AC04-76DP-00613)
(DE85-018311; BDX-613-3272) Avail: NTIS HC A03/MF A01

The development of a Technical Information Management System for the Materials Evaluation Laboratory was undertaken to reduce the labor required to determine the flow of work within the laboratory, provide sample tracking, and to make the results of tests available to the requestor more quickly. The analysis phase of this development project is now complete. Structured Analysis and Information Analysis were used to reduce the total life cycle costs for the system. The deliverables produced during the analysis phase include data flow diagrams, process mini-specifications, data flow definitions, data element definitions, dialog definitions, the system record structure with navigational paths, and user implementation requirements. These deliverables comprise the functional system specification. It is easily understood by laboratory personnel, computer scientists, and supervision. The specification is also easily maintained to meet changing laboratory requirements. DOE

N86-18245# Lawrence Livermore National Lab., CA.
BIBLIOGRAPHIC POST-PROCESSING WITH THE TIS INTELLIGENT GATEWAY: ANALYTICAL AND COMMUNICATION CAPABILITIES
H. D. BURTON Sep. 1985 90 p
(Contract W-7405-ENG-48)
(DE85-018153; UCID-20529) Avail: NTIS HC A05/MF A01

This report demonstrates the capabilities of the process functions of the TIS Intelligent Gateway. These functions support bibliometric analysis of a wide range of commercial and federal databases. Examples are provided of search output from five online search systems. Each set of citations was translated to a common format and then analyzed and reformatted using process. DOE

N86-19002# Logistics Management Inst., Bethesda, MD.
MICROCOMPUTER-BASED LOCAL AUTOMATION MODEL: FUNCTIONAL DESCRIPTION
R. W. HARTT and D. J. OCONNOR Oct. 1985 88 p
(Contract MDA903-85-C-0139)
(AD-A160610; LMI-DL503) Avail: NTIS HC A05/MF A01
CSCL 09/2

The Microcomputer-based Local Automated Model (MicroLAM) project will demonstrate the integration of a local collection management system with access to remote bibliographic data bases. Through an intelligent gateway processor, users of the system will be able to access a local catalog and the Defense Technical Information Center (DTIC) Technical Reports (TR) data base simultaneously. The system will consist of a commercial software package (for local collection management) integrated with a subset of the Lawrence Livermore National Laboratory (LLNL) Technology Information System (an intelligent gateway). The intelligent gateway permits sharing of bibliographic resources between the network of technical libraries and information centers within the Department of Defense (DoD) and the DoD technical information clearinghouse -- DTIC. Contained in this functional description are summary description, detailed characteristics and operating environment of the system, as well as the cost factors and development schedule of the LAM project. GRA

N86-19260# Lawrence Livermore National Lab., CA.
TEXT COMPRESSION USING WORD TOKENIZATION
G. LONG, I. MORRISON, and D. BARNETT 11 Sep. 1985 21 p
(Contract W-7405-ENG-48)
(DE86-000832; UCID-20526) Avail: NTIS HC A03/MF A01

This document describes a text compression scheme, its associated algorithms, and their implementation in the C programming language. The algorithms described only work for textural data. The current code and associated data dictionary are slanted toward general English language text such as technical reports and/or newspaper articles. With minor modifications to the code and by using special purpose dictionaries, the same algorithms could be used to compress special purpose text files such as compiler source listings. We achieve compression ratios of better than fifty percent and the routines are very fast. Typical applications produce significant reduction in data storage space and effectively double the transmission rate of documents between computers. DOE

N86-21431# Defense Technical Information Center, Alexandria, VA.
THE INTEGRATED BIBLIOGRAPHIC INFORMATION SYSTEM: RESOURCE SHARING TAILORED FOR LOCAL NEEDS Final Report
G. A. COTTER and R. W. HARTT Nov. 1985 11 p Presented at the International Online Meeting, London, England
(AD-A161700; DTIC/TR-85/17) Avail: NTIS HC A03/MF A01
CSCL 05/2

The Defense Technical Information Center (DTIC) is charged with providing information services to the scientific and technical community of the Department of Defense (DOD). These service range from collecting and disseminating bibliographic information to sponsoring and directing research into innovative information

handling technologies. Through this research, DTIC actively seeks ways to promote resource sharing as a means for speeding access to information while reducing the costs of information processing throughout the Defense technical library community. As part of this research, DTIC is sponsoring the development of an Integrated Bibliographic Information System (IBIS). The prototype of this system has been under development since April 1983. It will be used to demonstrate and evaluate the advantages of combining an integrated library system with an intelligent gateway capable of querying and updating -- simultaneously -- heterogeneous bibliographic databases. Queries and updates of databases will be performed using a common command language, relieving the system user of the need to master separate languages and procedures for each database accessed. Users will be able to download and post-process data from external sources. This capability will allow libraries to tailor search results, derived from external sources and a local catalog -- to their patron's needs and deliver a single product in an economical and efficient manner. GRA

N86-21432# Defense Technical Information Center, Alexandria, VA.
THE DOD GATEWAY INFORMATION SYSTEM Final Report
G. A. COTTER Oct. 1985 10 p Presented at the IEEE Conference, Williamsburg, Va.
(AD-A161701; DTIC/TR-85/16) Avail: NTIS HC A02/MF A01 CSCL 05/2

The Defense Technical Information Center (DTIC) is sponsoring development of a DOD Gateway Information System (DGIS) to provide online, streamlined methods for identifying, accessing, searching and analyzing data from heterogenous databases of interest to the DOD community. Present-day access to information resources (data-bases) is limited since each database has its own complex access procedure and command language. In addition, results from multiple databases cannot be combined or analyzed easily by the user. The Gateway will provide DOD researchers and managers access to many different databases using a single, simple access procedure. Queries of databases will be performed using a common command language, relieving the system user of the need to learn and master separate languages and procedures for each database accessed. A prototype system is under development at the Lawrence Livermore National Laboratory. The characteristics required in the DGIS and the development approach for designing a prototype system are described. GRA

N86-24558 George Washington Univ., Washington, DC.
A DESIGN METHODOLOGY FOR ON-LINE MENU-DRIVEN INFORMATION RETRIEVAL SYSTEMS Ph.D. Thesis
A. K. GHAHARI 1985 239 p
Avail: Univ. Microfilms Order No. DA8526773

Currently, there are thousands of information specialists, each one handling hundreds of queries per year. All information, if it is available for quick retrieval, has to be held in some sort of database as part of an information system. This thesis investigates a methodology for designing on-line menu-driven information retrieval systems that meet requirements for ease of use and quick response. The dissertation characterizes an interactive user interface based on a menu-driven system. The characterization begins by describing the menu-driven interface and goes on to model the basic menu systems. To address some of the more practical issues the design and implementation of HC Online Information System is discussed: an interactive and menu-based information system with quick response time. The design methodology is applied to HC Online using a hierarchical searching keys concept and inverted file techniques. Dissert. Abstr.

N86-25681# Oak Ridge National Lab., TN.
DESCRIPTION OF A TENTATIVE US-USSR COMMON COMMUNICATION FORMAT
N. B. COVE, A. A. BROOKS, S. I. SALAZKINA (State Public Library for Science and Technology, Moscow), V. V. KAPRALOVA, I. M. KHARINA, G. D. MATIUSHIN, M. A. AVETISOV (All-Union Inst. of Scientific and Technical Information, USSR), O. V. ZHUKOVETS, A. S. BARINOV (State Committee for Science and Technology, Moscow), N. V. TURTANOV et al. Nov. 1985 380 p Prepared in cooperation with Gosudarstvennyj Publichnaya Nauchno-Tekhicheskaya Biblioteka SSSR, Moscow; Vsesoyuznyj Inst. Nauchnoj i Tekhnicheskoj Informatsii, Moscow (USSR); Gosudarstvennyj Komitet So
(Contract DE-AC05-84OR-21400)
(DE86-004676; ORNL/CSD/TM-232) Avail: NTIS HC A17/MF A02

The Soviet-American Research Group for the Development of a Common Communication Format for Exchange of Bibliographic Information has prepared a draft format covering books, industrial catalogs, serials, articles, patents, and technical reports. This draft is intended to provide a possible format for exchange of bibliographic records on magnetic tape. Field definitions (tags, indicators, and subfields) are proposed for 105 bibliographic fields. International Standard ISO-2709 is used for the record structure on magnetic tape. DOE

N86-26026# Air Force Inst. of Tech., Wright-Patterson AFB, OH. School of Engineering.
A CONTEXTUAL POSTPROCESSING EXPERT SYSTEM FOR ENGLISH SENTENCE READING MACHINES M.S. Thesis
D. V. PACIORKOWSKI Dec. 1985 140 p refs
(AD-A163951; AFIT/GE/ENG/85D-31) Avail: NTIS HC A07/MF A01 CSCL 09/2

Knowledge-based programming techniques are used in an expert system to reduce uncertainty for optical character recognition by combing evidence from several diverse knowledge sources cooperating in an hierarchical configuration. The postprocessor development focused on a system for generic text input that is not confined to a fixed vocabulary or particular subject domain. The key element to the system's effectiveness is a spell checking algorithm that is not operationally bounded by an enumerated lexicon or biased by statistical sampling. The postprocessor system is also designed to interface almost any type OCR front-end methodology. GRA

N86-28779# Defense Technical Information Center, Alexandria, VA.
HOW EBENEZER SCROOGE AND PETER DRUCKER ARE HELPING SHAPE DOD'S SCIENTIFIC AND TECHNICAL INFORMATION PROGRAM
R. D. DOUGLAS 1985 5 p
(AD-A165640) Avail: NTIS HC A01/MF A01 CSCL 05/1

This paper is about developing a long range plan for the Defense Technical Information Center (DTIC). That plan, DTIC 2000 - A Corporate Plan for the Future, was published in July 1984. This paper highlights the methodology used to develop the plan. It also outlines an anticipated future information environment in which the Center will operate. Additionally, it displays the long range Scientific and Technical Information Program (STIP) goals which were developed for DTIC in the planning process. Before developing the plan, the group researched many planning and management reference sources. Two of these were particularly helpful in determining the planning methodology used to develop DTIC 2000. One key reference was written by Peter Drucker (Management: Tasks, Responsibilites, Practices), a recognized authority in the field of planning and management. The other key reference was from an unexpected source and author A Christmas Carol by Charles Dickens. Drucker's advice to long range planners closely parallels insights presented by Dickens in his Christmas story. GRA

N86-28792# Institute of Gas Technology, Chicago, IL.
ON-LINE INTERACTIVE DATABASE FOR THE STORAGE AND RAPID INFORMATION RETRIEVAL OF GAS INDUSTRY DATA
J. J. KRUSE, C. D. LANDAHL, and D. L. KLASS 1985 12 p Presented at the Personal Computer Applications in the Gas Industry Conference, Rosemont, Ill., 15-17 Jul. 1985
(TI86-900895; CONF-8507111-1) Avail: NTIS HC A03/MF A01

GasLine is an on-line interactive database for the storage and rapid information retrieval of archival-type gas industry data. It is

the first database of its kind dedicated to serving the gas industry with archival information. Several years of Gas Abstracts are already on-line and Energy Statistics will be available shortly. One of the features of gasLine is the availability of both textual and numerical data. Overall, a broad scope of information, much of which is not given wide distribution, will be made readily available on gasLine. GasLine will be available via TYMNET telecommunications. Benefits to the gas industry are far-ranging and can have a major impact in the areas of marketing, operations, finance, research, engineering, legal, regulatory, and policy functions. GasLine will be available for direct access by information specialists as well as other end users. Usage of gasLine is expected to result in higher individual productivity and greater efficiency of information and data manipulation and analysis. The best benefits are the combination of retrieval of need information almost instantaneously, and its strategic application. This is the essence of the time value of information which is likened to the time value of money or capital. Author

N86-28797# Office of the Under Secretary of Defense for Research and Engineering, Washington, DC. Research and Laboratory Management.
INFORMATION SERVICES: PROS AND CONS
L. YOUNG *In* AGARD The Value of Information as an Integral Part of Aerospace and Defence R and D Programmes 8 p Jan. 1986
Copyright Avail: NTIS HC A05/MF A01

A strong science and technology base is a national necessity in a competitive world, and adequate communication is a prerequisite for it. An individual, be it a policy maker, program manager, a bench scientist or engineer resorts to the information system if he believes it will save him or her time to first consult the written record rather than to undertake a repetitious experiment or investigation. The three components to an effective information service are the sources (those who provide or produce information), the users (those who need the information) and the professional information specialists (those who bind the whole system together). The cooperation toward information exchange of all those connected with research and development must be enlisted in support of the system of which they are a part. Author

N86-28799# King Research, Inc., Rockville, MD.
MEASURING THE VALUE OF INFORMATION AND INFORMATION SYSTEMS, SERVICES AND PRODUCTS
D. W. KING and J. M. GRIFFITHS *In* AGARD The Value of Information as an Integral Part of Aerospace and Defence R and D Programmes 15 p Jan. 1986
Copyright Avail: NTIS HC A05/MF A01

An approach for measuring the value of information and information systems, services and products is presented. Results of four research projects that have measured value of recorded information used by professional such as scientists, engineers, managers, etc. are also discussed. Furthermore, data are given on the value of such systems and services as a bibliographic database of international publications, online search systems and libraries. The approach used to measure value includes several perspectives. The first perspective is what users are willing to pay for information in terms of money (if exchanged) and the price paid by users in terms of their time and effort to get and read the information. Once information is read and assimilated, there are many purposes for which it might be used such as in one's work, to educate oneself or others, to satisfy one's curiosity, etc. The consequential value resulting from information use is partially measured by the savings that are derived from information use. Higher order values are how the consequential value affects the user's organization and, in turn, society. Author

N86-30570# Defense Technical Information Center, Alexandria, VA. Office of Information Systems and Technology.
THE DOD GATEWAY INFORMATION SYSTEM: PROTOTYPE EXPERIENCE Final Report
G. A. COTTER Apr. 1986 9 p
(AD-A166200; DTIC/TR-86/6) Avail: NTIS HC A02/MF A01 CSCL 05/2

The Department of Defense (DoD) Research and Engineering community requires rapid, easy access to scientific and technical information relevant to its mission. This information is contained in a multiplicity of databases maintained within the federal and commercial sectors. The DoD Gateway Information System (DGIS) is being developed to provide this community with a modern tool for accessing these databases and extracting information products from them. DGIS is designed to provide the DoD researcher with a single, user-friendly system front-end that can be used to identify, access, interrogate, and post-process information from numerous databases. The DGIS transforms these database and processing resources into a single entity - a virtual database. The Defense Technical Information Center (DTIC) is responsible for managing the design, development, and implementation of DGIS. A prototype version of DGIS is now undergoing test and evaluation. Eight information services have been selected as targets of the prototype gateway. The utility of DGIS will rest on the early acceptance and wide spread participation of users. The design accommodates, transparent to the user, the complexities of accessing, downloading, merging, and processing information from diverse sources. This paper describes DGIS developments and evaluations to date. GRA

N86-31448# Oak Ridge National Lab., TN. Fusion Energy Library.
INTEGRATED LIBRARY SYSTEM AT ORNL: LION
T. C. LIU Mar. 1986 11 p
(Contract DE-AC05-84OR-21400)
(DE86-008867; DOE/OR-21400/T257) Avail: NTIS HC A03/MF A01

Viewgraphs describing the ORNL minicomputer system LION comprise the report. This library system provides information resources and services to support research and development activities. DOE

N86-33203# Presearch, Inc., Fairfax, VA.
ANALYSIS OF THE USE OF DEFENSE TECHNICAL INFORMATION CENTER RESOURCES BY RESEARCH AND DEVELOPMENT CENTERS AND LABORATORIES IN THE US ARMY Final Report, Sep. 1984 - Sep. 1985
R. V. HUBBARD and K. F. ZACCARDO 8 Nov. 1985 247 p
(Contract DAAD05-84-C-0189)
(AD-A168441; TR-694) Avail: NTIS HC A11/MF A02 CSCL 05/2

This report describes the methodology, findings, and recommendations of a study of the use of Defense Technical Information Center (DTIC) resources and services by organizations in the Army Research and Development (R&D) Community. The purpose of the study was to investigate Army R&D use of and contribution to DTIC information resources and services, assess the benefits that the availability and use of DTIC resources provides to Army R&D, and develop recommendations for actions the Army might take to use and support DTIC more effectively. Author (GRA)

N86-33207# Sandia National Labs., Albuquerque, NM.
STATE OF THE ART OF GEOSCIENCE LIBRARIES AND INFORMATION SERVICES
N. J. PRUETT 1986 16 p Presented at the 3rd International Conference on Geoscience Information, Adelaide, Australia, 1 Jun., 1986
(Contract DE-AC04-76DP-00789)
(DE86-011188; SAND-86-1284C; CONF-8606122-1) Avail: NTIS HC A03/MF A01

Geoscience libraries and geoscience information services are closely related. Both are trying to meet the needs of the geoscientists for information and data. Both are also being affected by many trends: increased availability of personal computers; decreased costs of machine readable storage; increased availability of maps in digital format (Pallatto, 1986); progress in graphic displays and in developing Geographic Information System, (GIS)

(Kelly and Phillips, 1986); development in artificial intelligence; and the availability of new formats (e.g., CD-ROM). Some additional factors are at work at changing the role of libraries: libraries are coming to recognize the impossibility of collecting everything and the validity of Bradford's Law. Unobtrustive studies of library reference services have pointed out that only 50% of the questions are answered correctly. It is clear that the number of databases is increasing although good figures for specifically geoscience databases are not available; lists of numeric database are beginning to appear; evaluative (as opposed to purely descriptive) reviews of available bibliographic databases are beginning to appear; more and more libraries are getting online catalogs. DOE

N87-11630# Logistics Management Inst., Bethesda, MD.
MICROCOMPUTER-BASED LOCAL AUTOMATION MODEL: SYSTEM PLANNING GUIDANCE
R. W. HARTT and D. J. OCONNOR May 1986 24 p
(Contract MDA903-85-C-0139)
(AD-A168136; LMI-DL503; DTIC-TR-86/13) Avail: NTIS HC A03/MF A01 CSCL 05/2

Guidance is provided to Department of Defense libraries and information centers on implementing the microcomputer-based Local Automation Model, an integrated library system that includes intelligent gateway technology to search, download, analyze, merge and output citations from multiple databases. The document draws on the experience gained in implementing the micro-Lam prototype at the Technical Library, Headquarters US Army Training and Doctrine Command (HQ TRADOC) and provides an outline of tasks to be addressed in implementing the system at other installations. Tasks include deciding which functions to automate, determining requirements for peripheral equipment, and analyzing telecommunications and electrical requirements. Cost estimates for the system are also included. GRA

N87-16650# Texas Univ., Austin. Graduate School of Business.
A STUDY OF ORGANIZATIONAL INFORMATION SEARCH, ACQUISITION, STORAGE AND RETRIEVAL Final Report, Nov. 1983 - May 1986
GEORGE P. HUBER Aug. 1986 290 p
(Contract MDA903-83-C-0440; DA PROJ. 2Q1-61102-B-74-F)
(AD-A172063; ARI-RN-86-88) Avail: NTIS HC A13/MF A02 CSCL 05/1

The purpose of the study reported was to determine what is known and is not known about these organizational processes so that potential researchers and research resource providers might be wiser in their choice of research topics to study. Contents: Information Environments; How Organizations Learn: A Communication Framework; The Decision Making Paradigm of Organizational Design; Exploiting Information Technologies to Design More Effective Organizations; The Systems Paradigm in the Development of Organization Theory: Correcting the Record and Suggesting the Future; and Organizational Design: Proposed Theoretical and Empirical Research are presented. GRA

N87-19923# Logistics Management Inst., Bethesda, MD.
BIBLIOGRAPHIC NETWORKS AND MICROCOMPUTER APPLICATIONS FOR AEROSPACE AND DEFENSE SCIENTIFIC AND TECHNICAL INFORMATION
RICHARD W. HARTT *In* AGARD The Application of Microcomputers to Aerospace and Defence Scientific and Technical Information Work 16 p Oct. 1986
Copyright Avail: NTIS HC A06/MF A01

Bibliographic networks provide the means for sharing information resources among geographically dispersed libraries. As part of a bibliographic network, a single library can access a wide variety of bibliographic information, participate in shared cataloging, and acquire holdings (purchase or loan). Described here are: (1) the functions and operations of libraries supporting aerospace and defense scientific and technical work; (2) the environment and characteristics of bibliographic networks; and (3) the automated system capabilities required for network participation. A discussion of the use of microcomputers as cost-effective, yet powerful tools for exploiting bibliographic network resources is included. An automated system being developed for U.S. Department of Defense technical libraries is described. This system integrates local library functions with capabilities for accessing bibliographic network resources, both government and commercial. Author

N87-21739# Oak Ridge Gaseous Diffusion Plant, TN.
USING BAR CODE TECHNOLOGY TO ENHANCE CLASSIFIED DOCUMENT ACCOUNTABILITY
P. J. MOUNTAIN and D. J. WADE 1986 28 p Presented at the 14th Annual Conference of the DOE/Contractors Micrographics and Information Management Association, Pleasanton, Calif., 4 Nov. 1986
(Contract DE-AC05-84OT-21400)
(DE87-000760; K/CSD/INF-86/19P; CONF-8611101-1) Avail: NTIS HC A03/MF A01

This paper describes a system of resources and procedures coordinated to improve a classified document inventorying process. The Bar Code Document Accountability System (BARDAS) was developed to demonstrate the feasibility of improving the management and reporting timeliness of secret document inventories by the accountable custodians. The paper discusses the reasons for the development method, the extensive error-checking, the degree of user-friendliness, and the use of bar code technology in accomplishing these goals. Finally, the reactions of users to the system and future plans for enhancement are discussed. DOE

N87-26677# American Inst. of Aeronautics and Astronautics, New York, NY. Technical Information Services.
BENEFITS OF SCIENTIFIC AND TECHNICAL INFORMATION SERVICES FOR AEROSPACE AND DEFENSE
BARBARA LAWRENCE *In* Advisory Group for Aerospace Research and Planning and Designing Effective Defence and Related Information Services 4 p Apr. 1987
Copyright Avail: NTIS HC A06/MF A01

The benefits of having an aerospace and defense scientific and technical information service are considered based on an understanding of the literature in the field. The functions of a centralized information center and the nature of the research and development process are discussed. Author

N87-27551# Defense Technical Information Center, Alexandria, VA. Office of Information Systems and Technology.
DTIC (DEFENSE TECHNICAL INFORMATION CENTER) MODEL ACTION PLAN FOR INCORPORATING DGIS (DOD GATEWAY INFORMATION SYSTEM) CAPABILITIES Final Report, Oct. 1985 - May 1986
ALLAN D. KUHN and RANDY L. BIXBY May 1986 18 p
(AD-A181102; DTIC/TR-87/7) Avail: NTIS HC A03/MF A01 CSCL 05/2

The DOD Gateway Information System (DGIS) is being developed to provide the DOD community with a modern tool to access diverse databases and extract information products from them. The Defense Technical Information Center (DTIC) is responsible for the design, development, and implementation of DGIS. DGIS information processing capabilities are seen as a way of enhancing DTIC information services to its users, providing them with comprehensive results as compared with single database-specific results. A model plan for incorporating DGIS capabilities inhouse DTIC is formulated. A testbed office information flow survey is included. The survey aided as a mechanism to create the model plan, and serves as an example of the steps needed to plan for incorporating DGIS capabilities. GRA

N88-12420# Defense Technical Information Center, Alexandria, VA.
INFORMATION ANALYSIS CENTERS IN THE DEPARTMENT OF DEFENSE, REVISION
M. C. ROTHSCHILD Jul. 1987 160 p
(AD-A184002; DTIC/TR-87/17-REV) Avail: NTIS HC A08/MF A01 CSCL 05/2

The Department of Defense (DOD) Information Analysis Centers (IACs) have been assisting the research, development, and engineering efforts of the defense community for over forty years by analyzing, repackaging, and disseminating highly technical information in specialized subject areas to a select community. An overview of the IACs is presented, including an analysis of the IAC concept, followed by a brief history of the DOD IACs and an examination of some of the issues of concern to DOD IACs. IACs are not without their problems; nevertheless, they continue to have a significant role in the transfer of scientific and technical information. GRA

N88-13082# Lawrence Livermore National Lab., CA.
TOWARDS AUTOMATED CONSULTING: DESIGN FEEDBACK FROM THE PERFORMANCE OF ONLINE DOCUMENTATION
T. R. GIRILL, C. H. LUK, and S. NORTON Jul. 1987 8 p
Presented at the 50th Annual Meeting of the American Society for Information Science, Boston, Mass., 4 Oct. 1986
(Contract W-7405-ENG-48)
(DE87-012243; UCRL-96911; CONF-8610336-1) Avail: NTIS HC A02

Usage monitoring of online documentation at a supercomputer center strongly suggests the importance of three strategies in the design of an effective consulting system to deliver full-text answer passages to end users: (1) persistent on-demand printing as well as online viewing make a shared database economically vital; (2) a broad range of subject queries makes retrieval on diverse topics through a single user interface psychologically beneficial to readers, and (3) vocabulary mismatch errors demand an active response to faulty search terms, but not at the cost of increased interface complexity. DOE

N88-16574# Defense Technical Information Center, Alexandria, VA. Office of Information Systems and Technology.
DOD GATEWAY INFORMATION SYSTEM (DGIS) COMMON COMMAND LANGUAGE: PROLOG KNOWLEDGE BASE PROFILE. COMMON COMMAND LANGUAGE REPORT NO. 3
DUC T. TRAN Oct. 1987 8 p
(AD-A186150; DTIC/TR-87/23; DTIC-AI-FOUNDATION-SER-5)
Avail: NTIS HC A02/MF A01 CSCL 05/2

The initial phase of the Common Command Language (CCL) project was prototyped in C language. A test and evaluation of the prototypes showed that much more was needed to handle the wide variety and disparity of native command languages and operating characteristics of the multitude of information systems. PROLOG was chosen as a simple but powerful relational programming language based on the idea of programming in logic. PROLOG additionally fits well with the plan for gradual migration from a structured command language to a natural language. The current phase of the project utilizes Artificial Intelligence techniques of blackboard architecture and knowledge bases. PROLOG is the primary implementation language, coupled with low level system-related support functions written in C. GRA

N88-22822# Defense Technical Information Center, Alexandria, VA. Office of Information Systems and Technology.
THE SCIENTIFIC AND TECHNICAL INFORMATION NETWORK (STINET). FOUNDATION FOR EVOLUTION
GLADYS A. COTTER Sep. 1987 33 p
(AD-A189750; DTIC/TR-88/5) Avail: NTIS HC A03/MF A01 CSCL 05/2

This paper describes advances which are being made in information retrieval systems to assist end-users and information specialists to overcome the critical barriers which make it difficult for them to exploit the power of these systems. Technology which is being applied to allow users to interact with information retrieval systems with greater ease and more successful results is identified. To illustrate this process, the efforts of the U.S. Defense Technical Information Center to develop and implement an integrated, functional, scientific and technical information network are described. This network was purposefully designed to incorporate both end-users and their information management intermediaries in a complementary manner making them resolute partners in the work and its rewards. The uses of technology modules - artificial intelligence, expert systems, gateways, user-friendly interfaces - to overcome user barriers are described. GRA

N88-22823# Aerospace Structures Information and Analysis Center, Wright-Patterson AFB, OH.
APPLICATION OF NEW TECHNOLOGIES TO DTIC DOCUMENT PROCESSING Interim Report, Jun. - Aug. 1987
STEVEN G. HARRIS, R. L. CITERLEY, and DAVID F. CAHN Aug. 1987 42 p
(Contract F33615-84-C-3216)
(AD-A189778; ASIAC-887.1A) Avail: NTIS HC A03/MF A01 CSCL 05/2

The use of integrated optical character recognition (OCR) and database management technology to improve DTIC document input processing is examined. Significant near-term improvements in efficiency can be realized using commercially available components fused into an integrated system. An approach and system architecture are defined that will permit a staged implementation of this technology within the framework of the current DTIC work flow. While the emphasis of this report is on reducing labor-intensive manual keystroking operations presently in use, the proposed system provides an open ended approach which will interface easily with both existing and future DTIC operations. An in-depth review of current DTIC document processing was used to guide the definition of the pilot system architecture developed in this study, and the results of that review are presented and discussed. GRA

N88-23686 Naval Ocean Systems Center, San Diego, CA. Special Libraries Association.
TRANSLATIONS OF SCIENTIFIC AND TECHNICAL LITERATURE: A GUIDE TO THEIR LOCATION
KATHLEEN WRIGHT 1987 32 p
Avail: Issuing Activity

The purpose of this guide is to assist searchers in the location of English language translations of foreign scientific and technical literature. Strategies for locating an existing translation are given along with guidance for users who do not have access to the major bibliographic tools. Major providers of existing translations are described, and procedures for having a publication translated by a commercial firm or a government agency are suggested. Author

N88-27971# Logistics Management Inst., Bethesda, MD.
CAPITALIZING ON EXPERIENCE WITH INTELLIGENCE GATEWAY SOFTWARE Final Report
CYNTHIA W. SHOCKLEY Jan. 1988 139 p
(Contract MDA903-85-C-0139)
(AD-A193362; LMI-DL604R1; DTIC-TR-88/7) Avail: NTIS HC A07/MF A01 CSCL 12/5

The Defense Technical Information Center (DTIC) and National Library of Medicine (NLM) both developed gateway software to help users search, retrieve, and analyze information from different data systems, even when hardware and software incompatibilities exist. DTIC has two gateways: Defense Gateway Information System (DGIS) and Search Menu-Aided Easy Searching Through Relevant Options (Search MAESTRO). NLM also has two: Micro-Chemical Substances Information Network (Micro-CSIN) and Grateful MED. Each has strengths and weaknesses; DTIC and NLM experience with them, along with commercial and academic developments, reveal opportunities for improvements. We recommend that: (1) DTIC enhance DGIS to enable all users structure search strategies and select suitable databases, and adapt DGIS so that search terms used for one database can be used in several. Such improvements should enable DTIC to use DGIS to meet all user needs; (2) NLM improve the user-friendliness of Micro-CSIN with online and window prompting techniques and modify Micro-CSIN to incorporate controlled vocabulary terms and names into a search strategy. NLM should decide how to incorporate Micro-CSIN and Grateful MED into ABIDE; (3) DTIC and NLM adopt developments from the commercial and academic sectors such as an object-oriented gateway environment, develop

expert systems to aid in creating more effective search strategies, and consider cooperative funding arrangements for future gateway development. GRA

N88-30462# Defense Technical Information Center, Alexandria, VA.
INFORMATION RETRIEVAL SYSTEMS EVOLVE-ADVANCES FOR EASIER AND MORE SUCCESSFUL USE
GLADYS COTTER *In* AGARD, Barriers to Information Transfer and Approaches Toward Their Reduction 14 p Mar. 1988
Copyright Avail: NTIS HC A06/MF A01

The advances which are being made in information retrieval systems to assist end-users and information specialists to overcome the critical barriers which make it difficult for them to exploit the power of these systems are described. Technology which is being applied to allow users to interact with information retrieval systems with greater ease and more successful results is identified. To illustrate this process, the efforts of the U.S. Defense Technical Information Center to develop and implement an integrated, functional scientific and technical information network are described. This network was purposefully designed to incorporate both end-users and their information management intermediaries in a complementary manner making them resolute partners in the work and its rewards. The uses of technology modules (artificial intelligence, expert systems, gateways, user-friendly interfaces) to overcome user barriers are described. Author

N89-11620# Northrop Services, Inc., Research Triangle Park, NC. Environmental Sciences.
REFEREE: BIBLIOGRAPHIC DATABASE MANAGER, DOCUMENTATION
SLATE RAYMOND Oct. 1987 72 p
(Contract EPA-68-02-4198)
(PB88-200787; EPA/600/8-87/052A; EPA/SW/DK-88/047A)
Avail: NTIS HC A04/MF A01 CSCL 05/2

The publication is the user's manual for 3.xx releases of REFEREE, a general purpose bibliographic data base management program for IBM compatible microcomputers. The REFEREE software also is available from NTIS. The manual has two main sections: Quick Tour and Reference Guide; and a glossary, three appendixes, and an index. Quick Tour provides information sufficient to enable a new user to install and experiment with the program. Reference Guide provides detailed information about REFEREE databases, records, and fields; the primary command available to the user; and the most common sources of unexpected program behavior. Author

N89-14702# Naval Postgraduate School, Monterey, CA.
CD-ROM (COMPACT DISC READ ONLY MEMORY) LIBRARY OF THE FUTURE M.S. Thesis
KENNETH P. BUTRYM and HAGOP A. AVEDISSIAN Jun. 1988 132 p
(AD-A197943) Avail: NTIS HC A07/MF A01 CSCL 09/5

This thesis examines the feasibility of using the compact disc-read only memory (CD-ROM) as the storage medium for the Department of Defense (DOD) construction contracting. Specifically, the DOD sponsored program, headed by the Naval Facilities Engineering Command (NAVFAC), called Construction Criteria Base (CCB) is evaluated. The program is composed of a compact disc containing government construction criteria including Army, Navy and NASA standards. The test platform used is the specification branch of NAVFAC and its Engineering Field Divisions. The CD-ROM used in conjunction with a microcomputer is compared to the standards libraries of the present which are comprised of paper, microfilm and microfiche storage media. The conclusion reached is that the use of the CD-ROM disc in the DOD construction arena is advisable. GRA

N89-14943# Lawrence Livermore National Lab., CA.
INTERACTIVE ACCESS TO SCIENTIFIC AND TECHNOLOGICAL FACTUAL DATABASES WORLDWIDE
VIKTOR E. HAMPEL, DAVID P. GRUBB, and AMAL MOULIK Oct. 1987 25 p Presented at the Metallurgical Society Fall Meeting, Cincinnati, OH, 12-14 Oct. 1988
(Contract W-7405-ENG-48)
(DE88-016172; UCRL-97617; CONF-881030-2) Avail: NTIS HC A03/MF A01

We describe the performance of the Intelligent Gateway Processor (IGP) as a technical and cost-effective tool for inter-connectivity among heterogeneous resources on geographically distributed networks. The IGP software has been evaluated by several federal agencies and is now operational on over 100 UNIX-based computers from 14 different vendors in the NATO countries and in the United States. We then discuss the IGP capabilities, especially the flexibility and extensibility of the table-driven, interpreter-based system that permits the development of a unified approach to the management of scientific and technological information. This includes the automated interactive access to the large bibliographic databases worldwide, the extraction of relevant sets, compilation into a neutral data exchange format, and trend analysis of emerging technologies by statistical means and time-resolved pattern recognition. The expanding availability of numeric factual databases in science and engineering now also makes it possible to evaluate the leading Chemical Information Management Systems (CIMS) which provide specialized interfaces to the chemical bibliographies and the nomenclature and structures of substances. DOE

N89-14949*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
OVERVIEW OF THE NASA/RECON EDUCATIONAL, RESEARCH, AND DEVELOPMENT ACTIVITIES OF THE COMPUTER SCIENCE DEPARTMENTS OF THE UNIVERSITY OF SOUTHWESTERN LOUISIANA AND SOUTHERN UNIVERSITY Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. 31 May 1984 11 p Revised Prepared in cooperation with Southern Univ., Baton Rouge, LA
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184509; NAS 1.26:184509; DBMS.NASA/RECON-1)
Avail: NTIS HC A03/MF A01 CSCL 05/2

This document presents a brief overview of the scope of activities undertaken by the Computer Science Departments of the University of Southern Louisiana (USL) and Southern University (SU) pursuant to a contract with NASA. Presented are only basic identification data concerning the contract activities since subsequent entries within the Working Paper Series will be oriented specifically toward a detailed development and presentation of plans, methodologies, and results of each contract activity. Also included is a table of contents of the entire USL/DBMS NASA/RECON Working Paper Series. Author

N89-14961*# University of Southwestern Louisiana, Lafayette. Center for Advanced Computer Studies.
AN INNOVATIVE, MULTIDISCIPLINARY EDUCATIONAL PROGRAM IN INTERACTIVE INFORMATION STORAGE AND RETRIEVAL. PRESENTATION VISUALS M.S. Thesis Final Report, 1 Jul. 1985 - 31 Dec. 1987
WAYNE D. DOMINICK, ed. and MARY C. GALLAGHER 7 Feb. 1985 35 p Prepared in cooperation with Southern Univ., Baton Rouge, LA
(Contract NASW-3846; NGT-19-010-900)
(NASA-CR-184521; NAS 1.26:184521; DBMS.NASA/RECON-13)
Avail: NTIS HC A03/MF A01 CSCL 05/2

This Working Paper Series entry represents a collection of presentation visuals associated with the companion report entitled An Innovative, Multidisciplinary Educational Program in Interactive Information Storage and Retrieval, USL/DBMS NASA/RECON Working Paper Series report number DBMS.NASA/RECON-12. The project objectives are to develop a set of transportable, hands-on, data base management courses for science and engineering students to facilitate their utilization of information storage and retrieval programs. Author

N89-15829*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
IUE ARCHIVED SPECTRA
EDWARD C. SULLIVAN, RALPH C. BOHLIN, SARA R. HEAP, DONALD K. WEST, and MARION SCHMITZ (Computer Sciences Corp., Silver Spring, MD.) Jun. 1988 25 p
(NASA-TM-100715; REPT-89B0037; NAS 1.15:100715) Avail: NTIS HC A03/MF A01 CSCL 03/1

The International Ultraviolet Explorer (IUE) Satellite has been in continuous operation since January 26, 1978. To date, approximately 65,000 spectra have been stored in an archive at Goddard Space Flight Center in Greenbelt, MD. A number of procedures have been generated to facilitate access to the data in the IUE spectral archive. This document describes the procedures which include on-line quick look of the displays, search of an observation data base for selected observations, and several methods for ordering data from the archive. Author

N89-16301*# Mitre Corp., Bedford, MA.
A COMPUTER-BASED SPECIFICATION METHODOLOGY
ROBERT G. MUNCK *In* NASA, Lyndon B. Johnson Space Center, First International Conference on Ada (R) Programming Language Applications for the NASA Space Station, Volume 1 7 p 1986
Avail: NTIS HC A18/MF A03 CSCL 09/2

Standard practices for creating and using system specifications are inadequate for large, advanced-technology systems. A need exists to break away from paper documents in favor of documents that are stored in computers and which are read and otherwise used with the help of computers. An SADT-based system, running on the proposed Space Station data management network, could be a powerful tool for doing much of the required technical work of the Station, including creating and operating the network itself. Author

N89-16303*# Houston Univ., Clear Lake, TX.
DEC ADA INTERFACE TO SCREEN MANAGEMENT GUIDELINES (SMG)
SOMSAK LAOMANACHAREON and ANTHONY A. LEKKOS *In* NASA, Lyndon B. Johnson Space Center, First International Conference on Ada (R) Programming Language Applications for the NASA Space Station, Volume 1 5 p 1986
Avail: NTIS HC A18/MF A03 CSCL 09/2

DEC's Screen Management Guidelines are the Run-Time Library procedures that perform terminal-independent screen management functions on a VT100-class terminal. These procedures assist users in designing, composing, and keeping track of complex images on a video screen. There are three fundamental elements in the screen management model: the pasteboard, the virtual display, and the virtual keyboard. The pasteboard is like a two-dimensional area on which a user places and manipulates screen displays. The virtual display is a rectangular part of the terminal screen to which a program writes data with procedure calls. The virtual keyboard is a logical structure for input operation associated with a physical keyboard. SMG can be called by all major VAX languages. Through Ada, predefined language Pragmas are used to interface with SMG. These features and elements of SMG are briefly discussed. Author

N89-18758# Colorado Univ., Boulder. Lab. for Atmospheric and Space Physics.
INFORMATION SYSTEMS FOR THE SPACE STATION ERA
G. H. LUDWIG *In* ESA, Proceedings of the 1988 International Geoscience and Remote Sensing Symposium (IGARSS) '88 on Remote Sensing: Moving Towards the 21st Century, Volume 3 p 1497-1499 Aug. 1988
Copyright Avail: NTIS HC A99/MF A01; ESA Publications Division, ESTEC, Noordwijk, Netherlands, $120 US or 250 Dutch guilders

Space Station research user requirements are discussed. Users will need more discriminating measurements, require higher data rates, and conduct new kinds of interdisciplinary studies. Widely dispersed collaborators will employ data from multiple instruments in studies of global scale, which will necessitate more investigator involvement in planning, control, and use of their data. A user environment must be designed to meet these challenges, and the design concepts should include: a distributed, cohesive system architecture; a homogeneous, stable set of user interfaces; structured systems that can, in many respects, be transparent to users; and easy transfer of data among collaborators. Investigators must take an active role in the development of the systems. ESA

N89-20028# Idaho National Engineering Lab., Idaho Falls.
STATUS OF DOE INFORMATION NETWORK MODIFICATIONS
RON FUCHS 1988 6 p Presented at the 10th Annual DOE Low-Level Waste Management Conference, Denver, CO, 30 Aug. 1988
(Contract DE-AC07-76ID-01570)
(DE89-005191; EGG-M-88377; CONF-880839-13) Avail: NTIS HC A02/MF A01

This paper provides an update for conference participants on changes, that have been made, or are taking place, to the Department of Energy's National Information Network. A question and answer period is anticipated. Areas of focus are data acquisition from commercial disposal site operators, improved access methods to DOE Information network, progress on personnel computer interfaces, and availability of end user support. DOE

N89-20677# Unisys Corp., Paoli, PA.
INTEGRATING SYNTAX, SEMANTICS, AND DISCOURSE DARPA (DEFENSE ADVANCED RESEARCH PROJECTS AGENCY) NATURAL LANGUAGE UNDERSTANDING PROGRAM Status Report, 1 Aug. - 31 Oct. 1988
LYNETTE HIRSCHMAN 21 Nov. 1988 3 p
(Contract N00014-85-C-0012; ARPA ORDER 5262)
(AD-A203747) Avail: NTIS HC A01/MF A01 CSCL 05/2

A merged lexicon for all domains has been created. The merged lexicon contains about 2400 distinct root words. A tool for extracting lexical items from a dictionary, given a word list, was used to obtain items from the merged lexicon for the resource management domain. Approximately 47 percent of the vocabulary (or 448 words) in this domain is new. However a large number of these words are proper names of ships and locations, which are relatively trivial to enter. There are about 225 other words, including about 50 verbs. Because there are so few verbs, we expect adding the lexical entries to take only a few days. GRA

N89-20859# General Accounting Office, Washington, DC.
SPACE OPERATIONS: TESTING OF NASA'S TECHNICAL AND MANAGEMENT INFORMATION SYSTEM
Mar. 1988 8 p
(GAO/IMTEC-88-28) Avail: NTIS HC A02/MF A01

The status of the development of the National Aeronautics and Space Administration's Technical and Management Information System (TMIS) is presented. TMIS is intended to support the design, development, and operation of the planned space station. The parameters involved in the development of TMIS are data base management, project management, document management, electronic mail, workstations, hardware, interfaces and networking. It is estimated that initial operating capability (IOC) will be available at all NASA Centers by June 1988. M.G.

N89-20866# Massachusetts Inst. of Tech., Cambridge. Artificial Intelligence Lab.
USING ENGLISH FOR INDEXING AND RETRIEVING
BORIS KATZ Oct. 1988 32 p
(Contract N00014-85-K-0124)
(AD-A202227; AI-M-1096) Avail: NTIS HC A03/MF A01 CSCL 05/7

This paper describes a natural language system START. The system analyzes English text and automatically transforms it into an appropriate representation, the knowledge base, which incorporates the information found in the text. The user gains access to information stored in the knowledge base by querying it in English. The system analyzes the query and decides through a matching process what information in the knowledge base is

relevant to the question. Then it retrieves this information and formulates its response in English. GRA

N89-20869# Defense Applied Information Technology Center, Alexandria, VA. Hypermedia Lab.
THE DOD GATEWAY INFORMATION SYSTEM (DGIS): THE DEVELOPMENT TOWARD ARTIFICIAL INTELLIGENCE AND HYPERMEDIA IN COMMON COMMAND LANGUAGE
ALLAN D. KUHN Dec. 1988 18 p
(AD-A203674; DAITC/TR-88/009; DTIC/TR-89/4) Avail: NTIS HC A03/MF A01 CSCL 05/2

DGIS CCL Development began with C language prototyping to study its feasibility and issues. The study raised the potential of employing Artificial Intelligence, and DGIS CCL is now proceeding on two levels. The first level in incorporating Artificial Intelligence as a means to handle the heterogeneous universe of diverse information systems. This is done with PROLOG, using its logic programming capabilities for structuring knowledge base and blackboard architectures. The knowledge bases contain information about the target system commands and operating characteristics, and about users to establish a more graceful and human response in the human-machine interface. AI-based CCL, still in development, is available to all DGIS users. The second level incorporates the hypermedia capabilities of bit-map systems, to run concurrently with those that are ASCII-dependent. A desktop environment is being developed that includes icon selection, windowing technology, simultaneous query invoking and results display n multiple target systems, and color as an enhancing feature. As a part of the hypermedia application, integration with media peripherals such as CD-ROM databases will also be included.
GRA

N89-21706# Tennessee Univ., Knoxville.
AUTOMATED LIBRARY SYSTEMS AND DOCUMENT TRACKING SYSTEMS: COMMERCIAL SOFTWARE ALTERNATIVES, VOLUME 1
J. T. PHILLIPS and P. M. TARRANT Feb. 1989 138 p
Sponsored in part by Pacific Missile Test Center, Point Mugu, CA
Prepared for Oak Ridge Gaseous Diffusion Plant, TN
(Contract DE-AC05-84OT-21400)
(DE89-007716; K/DSRD-55-VOL-1) Avail: NTIS HC A07/MF A01

Automated Library Systems (ALS) have become complex and powerful applications, and they are increasingly selected as appropriate solutions to the challenge of tracking reports and other documents within organizations. The present ALS prototype at the Pacific Missile Testing Center (PMTC) at Point Mugu, California, was developed in-house and has been in existence for some time. However, with an expected change in the present computing environment on which the ALS presently resides (UNIVAC 1100), a discussion of the features of potential commercial software alternatives was requested. The purpose of this study was to provide an information base of presently available software systems that are similar in operation or capabilities to the present ALS at PMTC. A future step will entail review of this data and begin a selection process. Various Automated Library Systems and Automated Records Management Systems were profiled to allow comparison of their features to the present system. A bibliography of selected readings was provided to assist the PMTC in its initial effort to assess future needs. DOE

N89-22334*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
SPACE DATA MANAGEMENT AT THE NSSDC (NATIONAL SPACE SCIENCES DATA CENTER): APPLICATIONS FOR DATA COMPRESSION
JAMES L. GREEN *In its* Proceedings of the Scientific Data Compression Workshop p 85-98 Feb. 1989
Avail: NTIS HC A19/MF A03 CSCL 05/2

The National Space Science Data Center (NSSDC), established in 1966, is the largest archive for processed data from NASA's space and Earth science missions. The NSSDC manages over 120,000 data tapes with over 4,000 data sets. The size of the digital archive is approximately 6,000 gigabytes with all of this data in its original uncompressed form. By 1995 the NSSDC digital archive is expected to more than quadruple in size reaching over 28,000 gigabytes. The NSSDC digital archive is expected to more than quadruple in size reaching over 28,000 gigabytes. The NSSDC is beginning several thrusts allowing it to better serve the scientific community and keep up with managing the ever increasing volumes of data. These thrusts involve managing larger and larger amounts of information and data online, employing mass storage techniques, and the use of low rate communications networks to move requested data to remote sites in the United States, Europe and Canada. The success of these thrusts, combined with the tremendous volume of data expected to be archived at the NSSDC, clearly indicates that innovative storage and data management solutions must be sought and implemented. Although not presently used, data compression techniques may be a very important tool for managing a large fraction or all of the NSSDC archive in the future. Some future applications would consist of compressing online data in order to have more data readily available, compress requested data that must be moved over low rate ground networks, and compress all the digital data in the NSSDC archive for a cost effective backup that would be used only in the event of a disaster. Author

N89-22525 Rutgers - The State Univ., New Brunswick, NJ.
TECHNICAL REPORT LITERATURE IN CHEMISTRY AND ENGINEERING: BIBLIOMETRIC AND CONTENT ANALYSIS Ph.D. Thesis
A. RAHMAN KHAN 1988 219 p
Avail: Univ. Microfilms Order No. DA8901096

The external impact of Technical Reports (TRs) in chemistry and engineering, their secondary coverage, referencing patterns and selected physical characteristics were examined. The findings were compared against journal articles (JA) in similar disciplines. Samples for TRs were drawn from NTIS database and samples for JAs were drawn from CASEARCH and COMPENDEX databases. Citation measures were used for establishing the amount of external impact. Degree of secondary coverage TRs was based on amount of references to TRs in CASEARCH and COMPENDEX databases. The referencing pattern was established by reviewing the total number and types of references in the selected sample. Select physical characteristics of these vehicles of communication were also examined. A total of seventeen research hypotheses were proposed. All but three were supported. Findings indicate that: (1) in both these disciplines compared to JAs, the external impact of TRs is extremely low; (2) when TRs or JAs were cited, the references were made usually within one to two years of the issue of the document; and (3) the secondary coverage of chemistry TRs by Chemical Abstracts is low and the coverage of the engineering TRs by Engineering Index is minimal. Other important findings also indicate use patterns of available sources by scientists and the ability of select physical characteristics, as independent variables, to differentiate between document types.
Dissert. Abstr.

N89-23370# National Technical Information Service, Springfield, VA.
IDENTIFYING USERS AND HOW TO REACH THEM
JOSEPH F. CAPONIO, FREDERICK L. HAYNES, and A. RAHMAN KHAN *In* AGARD, The Organisation and Functions of Documentation and Information Centres in Defence and Aerospace Environments 5 p Mar. 1989
Copyright Avail: NTIS HC A06/MF A01

The importance of timely use of scientific and technical information is increasingly being recognized by the developing nations as well as the developed nations. It is recognized that it is not only important to develop a better mouse-trap but also it is equally important to ascertain that there is proper diffusion of such an innovation. Knowledge could lay dormant if it does not reach the end-users when they most need it. An attempt is made to address why this is important and focuses on some of the factors involved in identifying and reaching the end-users.
Author

N89-23374# Defense Applied Information Technology Center, Alexandria, VA.
FOSTERING INTERACTION OF GOVERNMENT, DEFENSE, AND AEROSPACE DATABASES
VIKTOR E. HAMPEL *In* AGARD, The Organisation and Functions of Documentation and Information Centres in Defence and Aerospace Environments 20 p Mar. 1989
Copyright Avail: NTIS HC A06/MF A01

The Department of Defense (DOD) knowledge worker needs rapid access to select information contained in government, defense, and aerospace databases. In the United States, information of use to defense and aerospace specialists are contained in multiple government databases as well as in commercial databases. Policy and technology strategies are addressed, which are being developed by the Defense Technical Information Center (DTIC) to foster better interaction among government, defense, and aerospace databases. To improve interactions, considerable progress was made by evolving standards in communication protocols, operating systems of computers, database management systems, and command structures, but it is the Defense Gateway technology that permits interconnectivity and interoperability in the interim period. This makes it possible to make the growing number of heterogeneous databases available to the defense community in a progressively more unified and automated manner. The results of several projects that introduce a high degree of information robotics to Information Resource Management (IRM) with substantial increases in human productivity are described. Author

N89-23377# RANA Associates, Santa Clara, CA.
MICROFILM AND COMPUTER FULL TEXT OF ARCHIVAL DOCUMENTS
13 Oct. 1988 9 p
(Contract N00014-85-C-0653)
(AD-A204055) Avail: NTIS HC A02/MF A01 CSCL 14/4

The development of the computer, and more recently the personal computer, has provided a possible solution to the major logistics problem of the storage and retrieval of archival data. An efficient or economical manual solution was precluded by the number of people necessary to support a very large data-base and the main bottleneck has occurred in the retrieval and later refiling of the data of interest. In addition, original documents have a finite lifetime, which is adversely affected each time a document is handled. Microfilm retention of data has provided a partial solution, but does suffer from several serious drawbacks. In general, it has very poor spatial resolution especially when archival information contains diagrams, figures, and photographs in addition to alpha-numeric data. Storage parameters such as heat and humidity, as well as the amount of usage by individuals also affect the lifetime of the microfilm itself. A very large microfilm data-base requires the services of information retrieval specialists to provide an efficient library function for users, thereby increasing the overhead. The intent of this contract is to develop and demonstrate the archival storage of documents using computer-based imaging techniques and the retrieval of these documents by standard database management software. GRA

N89-23380# Los Alamos National Lab., NM.
RELEVANCE OF INTERNATIONAL RESEARCH FACILITIES TO INTERNATIONAL STABILITY
LOUIS ROSEN 20 Mar. 1989 14 p Presented at the 4th European Physical Society Seminar on International Research Facilities, Zagreb, Yugoslavia, 17 Mar. 1989
(Contract W-7405-ENG-36)
(DE89-009400; LA-UR-89-813; CONF-890388-1) Avail: NTIS HC A03/MF A01

International Facilities have played an important play in expanding and keeping open a dialog between east and west. The advent of glasnost has dramatically reduced inhibitions on communications and opened new opportunities for international facilities to facilitate the understanding and appreciation of common goals and common threats. This is accomplished through frank discussions in which real problems are identified and assessed while fictitious ones are laid to rest. DOE

N89-23381# New Mexico Technet, Inc., Albuquerque.
TECHNOLOGY TRANSFER REPORT Final Report
15 Jun. 1988 19 p
(Contract DE-FG04-84AL-26034)
(DE89-009044; DOE/AL-26034/T6) Avail: NTIS HC A03/MF A01

For the past year New Mexico Technet, Inc. (Technet), has been working with the national laboratories, the universities and private industry to develop ways in which Technet can be used to provide and enhance technology transfer. This final report will track our progress toward creating a technology transfer data base, establishing industry-laboratory pilot projects and identifying other types of assistance Technet can provide industry and state government. This report will follow the outline of the Scope of Work set forth in our contract with the Department of Energy. A chronology of progress is included, as well as written documentation of requests Technet has made to the laboratories and meetings Technet staff has held with industries, laboratories and universities. Following our discussion of the work undertaken this year, Technet will provide its conclusions on the strengths and weaknesses of the project, how we feel its mission can be continued, and suggestions the Department of Energy might make to its laboratories in the area of technology transfer through the new tools available in various states, including communications networks and technology foundations, such as Riotech. DOE

N89-25771 California Univ., Los Angeles.
BIBLIOGRAPHIC COUPLING AMONG SCIENTIFIC PAPERS IN BIOLOGICAL RESEARCH SPECIALTIES Ph.D. Thesis
MARILYN KAYE SLATER 1988 236 p
Avail: Univ. Microfilms Order No. DA8906125

Bibliographic coupling strength among scientific papers was studied as an information variable and evaluated as an indicator of specialties in biology. Three specialties were identified from corresponding review articles and were characterized along four facets: systems, conditions, observations, and methods. Papers in each sample were assigned a degree of membership in the specialty depending upon facet representation. Specialty samples were used to evaluate two bibliographic coupling measures, author and reference coupling, with regard to: (1) the relation of coupling strength between papers to degree of membership in a specialty, (2) the distribution of coupling strengths among pairs of papers, and (3) the power of each measure to resolve a mixed sample into constituent specialties by cluster analysis. Members of specialties generally exhibited higher bibliographic coupling strengths than did non-members; however, the variability in coupling strengths was high for all degrees of membership. Distribution of coupling strengths among pairs of papers followed a power law, similar to laws of Lotka and Zipf. Author and reference coupling performed well as similarity measures in cluster analyses when combined with group average hierarchical agglomerative clustering. Resulting cluster patterns showed good resolution of specialties, but author coupling performed somewhat better than reference coupling as a similarity measure. Dissert. Abstr.

N89-26780# Naval Postgraduate School, Monterey, CA.
A MULTIMEDIA DATABASE MANAGEMENT SYSTEM SUPPORTING CONTENTS SEARCH IN MEDIA DATA Progress Report, Oct. 1988 - Jan. 1989
VINCENT Y. LUM and KLAUS MEYER-WEGENER Mar. 1989 33 p
(AD-A207070; NPS52-89-020) Avail: NTIS HC A03/MF A01 CSCL 12/7

It is now feasible to store and manage in computers new types of data like text, images, graphics, and sound recordings. It is proposed that database management systems should be extended to organize these new types of data and to enable search based on their contents. Media objects are modeled as attributes of abstract data types. The contents are captured in terms of natural language descriptions and are translated by a

parser into predicates for easy matching with query phrases. The implications of this approach are discussed: Data organization for multimedia including contents representation, the dictionary used by the parser to recognize words and assign predicates, rules to use semantic relationships in the query evaluation, and access paths to speed up the search for the descriptions. The result is an architecture for multimedia database management systems that combines the additional components needed with the conventional data management and identifies their ways of interaction. Three types of user interfaces are offered that require different levels of skill. The architecture is modular and allows the integration of more advanced AI techniques once they become available.
GRA

N89-27196# Science Applications International Corp., McLean, VA.
RISK ASSESSMENT OF COMPRESSED NATURAL GAS-FUELED VEHICLE OPERATIONS, PHASE 1 Topical Report, Dec. 1987 - Nov. 1988
DAVID M. FRIEDMAN and LAURA C. ZUBER Feb. 1989 192 p
(Contract GRI-5087-254-1621)
(PB89-188841; GRI-89/0037) Avail: NTIS HC A09/MF A01
CSCL 13/6

The Gas Research Institute has embarked on a technology and safety oriented program with the objective of developing a cost-effective, advanced natural gas engine, a compression station, and storage systems that will capitalize on the economic and environmental benefits of using natural gas in vehicular applications. As the first step in a two phase project, a program was initiated to develop a remotely accessible and publicly available, international data base of natural gas vehicle (NGV) safety information. Its purpose is to improve GRI's ability to conduct detailed, quantitative risk assessments of NGVs and NGV systems. In addition to bibliographic reference, scientific data are currently available in a computerized, menu-driven data base management system (DBMS). Data reflect current, domestic, and international knowledge of NGV safety, fire, and injury statistics, refueling station equipment design, and applicable codes and standards. Additional data required for a probabilistic risk assessment include topics such as vehicle component failure modes, strength of materials, natural gas physical properties, and general transportation safety statistics.
Author

N84-74126# Georgia Inst. of Tech., Atlanta. School of Information and Computer Science.
NATIONAL STI (SCIENTIFIC AND TECHNICAL INFORMATION) SYSTEM OF EGYPT: IMPLEMENTATION
V. SLAMECKA Nov. 1981 74 p refs
(Contract NSF INT-79-24187)
(PB84-161777; NSF/INT-81003)

N84-75065# Defense Technical Information Center, Alexandria, VA.
THE SHARED BIBLIOGRAPHIC INPUT NETWORK (SBIN): A SUMMARY OF THE EXPERIMENT
G. A. COTTER May 1980 22 p
(AD-A133001; DTIC/TR-83/5)

N86-72104# Office of the Under Secretary of Defense for Research and Engineering, Washington, DC.
CENTERS FOR ANALYSIS OF SCIENTITIC AND TECHNICAL INFORMATION REGULATION
Jan. 1985 15 p
(PB86-174315; DOD-3200.12-R-2)

N88-70731 Department of Energy/Contractors Micrographics and Information Management Association, Washington, DC.
PROCEEDINGS OF THE 14TH ANNUAL CONFERENCE OF THE DEPARTMENT OF ENERGY/CONTRACTORS MICROGRAPHICS AND INFORMATION MANAGEMENT ASSOCIATION
1986 228 p Conference held in Los Alamos, Tenn., 4-7 Nov. 1986
(DE88-000230; CONF-8611101) Avail: NTIS

N89-70333*# National Aeronautics and Space Administration, Washington, DC.
NASA SCIENTIFIC AND TECHNICAL INFORMATION SYSTEM STUDY
RICHARD M. BURR 1978 76 p
Avail: NTIS

SYSTEMS SECURITY

In a time when we are doing our best to use the systems made available to us, we also have to protect our computers and networks against hostile access by those wanting to plant viruses, or lift, scramble, or destroy data.

A85-42593
SECURITY IMPLICATIONS OF THE SPACE STATION INFORMATION SYSTEM
R. W. BURNS (ORI, Inc., Rockville, MD) IN: Protecting intellectual property in space; Proceedings of the Aerospace Computer Security Conference, McLean, VA, March 20, 1985. New York, IEEE, 1985, p. 3-10. refs
Copyright

The present paper concentrates on aspects of the Space Station itself, all Space Station Program Elements (SSPE) that interact with the Space Station, and the telecommunications of the Space Station to the ground system through NASA's Tracking and Data Relay Satellite System (TDRSS). It is pointed out that one of the major concerns of potential commercial customers of the Space Station is NASA's ability to assure data privacy. A Space Station Information System (SSIS) overview is provided, and the types of user data are examined. Security implications are discussed, taking into account the SSIS environment, the protection of the physical assets of the SSIS, personnel security, computer hardware, computer software, procedural (operational) security, communications security, emanation security, and education and training regarding the security implications of the SSIS.
G.R.

A85-42594*# National Aeronautics and Space Administration, Washington, DC.
SPACE SHUTTLE SECURITY POLICIES AND PROGRAMS
E. L. KEITH (NASA, Shuttle Operations Div., Washington, DC) IN: Protecting intellectual property in space; Proceedings of the Aerospace Computer Security Conference, McLean, VA, March 20, 1985. New York, IEEE, 1985, p. 11-20. refs

The Space Shuttle vehicle consists of the orbiter, external tank, and two solid rocket boosters. In dealing with security two major protective categories are considered, taking into account resource protection and information protection. A review is provided of four basic programs which have to be satisfied. Aspects of science and technology transfer are discussed. The restrictions for the transfer of science and technology information are covered under various NASA Management Instructions (NMI's). There were two major events which influenced the protection of sensitive and private information on the Space Shuttle program. The first event was a manned space flight accident, while the second was the enactment of a congressional bill to establish the rights of privacy. Attention is also given to national resource protection and national defense classified operations.
G.R.

A85-42595
POTENTIAL USES OF PROBABILISTIC RISK ASSESSMENT TECHNIQUES FOR SPACE STATION DEVELOPMENT
S. Z. BRUSKE, R. E. WRIGHT (EG&G Idaho, Inc., Idaho Falls, ID), and W. D. GEASLEN (EG&G Space Systems, Titusville, FL)

IN: Protecting intellectual property in space; Proceedings of the Aerospace Computer Security Conference, McLean, VA, March 20, 1985. New York, IEEE, 1985, p. 21-29. refs
(Contract DE-AC07-76ID-01570)
Copyright

It is pointed out that Probabilistic Risk Assessment (PRA) is a methodology used effectively in the nuclear power industry to determine the risk to the general public from the operation of nuclear power plants. Details regarding the application of PRA in the nuclear industry are illustrated with the aid of a simplified example. The various steps in the risk assessment process are discussed, taking into account the determination of the initiating events, aspects of event tree development, the fault tree, component failure data bases, and consequence determination. Questions regarding the application of the PRA methodology to space station computer security are also explored, giving attention to a hypothetical example to demonstrate the methodology. The purpose of the Initiating Event Logic Diagram (IELD) is to identify the threats to the space station computer security in a structured, logical manner. The Space Station Computer Security Function Event Tree is also developed. G.R.

A85-42596
KEY CONSIDERATIONS IN CONTINGENCY PLANNING FOR SECURE SPACE FLIGHT GROUND CONTROL CENTERS
J. E. SUMMERTON (Booz, Allen and Hamilton, Inc., Bethesda, MD) IN: Protecting intellectual property in space; Proceedings of the Aerospace Computer Security Conference, McLean, VA, March 20, 1985. New York, IEEE, 1985, p. 31-38.
Copyright

The present paper is concerned with contingency planning considerations which address the operational, security, and cost issues of protecting sensitive data during an emergency relocation of protected spacecraft ground systems. Attention is given to the assignment of priorities, backup facility design, a structure for information security, security and backup site readiness, transition to the backup facility, and budgetary considerations. In connection with the latter considerations, questions of loss expectancy are discussed along with the management of the security risk, ground station outages, and the contingency budget baseline. G.R.

A85-42597
A SYSTEMATIC METHOD FOR EVALUATING SECURITY REQUIREMENTS COMPLIANCE
N. W. TYRA and P. A. MILES (ORI, Inc., Rockville, MD) IN: Protecting intellectual property in space; Proceedings of the Aerospace Computer Security Conference, McLean, VA, March 20, 1985. New York, IEEE, 1985, p. 39-47.
Copyright

This paper introduces the Security Compliance Analysis Model (SCAM) as a tool for evaluating the degree of security requirement satisfaction. The model provides a means for compiling independently derived compliance evaluations over the broad spectrum of security issues; Comsec, Opsec, Tempest and Red/Black, ADPE Security, Physical Security, Information Security, Industrial Security, and System Security Areas. The model relates these broad security issues to their constituent parameters (partitioning, shielding, isolation, separation, etc.) via a hierarchical tree structure. Also provided is a means for assigning relational weighting factors which signify the parameter's relative significance to the overall security category. Finally, the model interprets compliance factors and proceeds through a mathematical algorithm to generate a series of scoring values which may be graphed over time. Author

A85-42598
SECURITY ENGINEERING OF SECURE GROUND STATIONS
L. BICKNER (Booz, Allen and Hamilton, Inc., Bethesda, MD) IN: Protecting intellectual property in space; Proceedings of the Aerospace Computer Security Conference, McLean, VA, March 20, 1985. New York, IEEE, 1985, p. 49-54.
Copyright

This paper describes the techniques and methodologies of security engineering as applied to the development of ground stations that support spaceflight operations. The integration of traditional security disciplines into an overall systems engineering approach is described. The issues of securability, relative security, and cost versus security are discussed with practical examples. This paper concludes by presenting a security engineering development program model which highlights the costs and associated benefits of a fully integrated security engineering methodology and suggests ways in which this methodology may be applied to the development of future ground stations. Author

A85-42600* Computer Sciences Corp., Falls Church, VA.
RESTRICTED ACCESS PROCESSOR - AN APPLICATION OF COMPUTER SECURITY TECHNOLOGY
E. M. MCMAHON (Computer Sciences Corp., Systems Div., Falls Church, VA) IN: Protecting intellectual property in space; Proceedings of the Aerospace Computer Security Conference, McLean, VA, March 20, 1985. New York, IEEE, 1985, p. 71-73.
(Contract NAS5-27351)
Copyright

This paper describes a security guard device that is currently being developed by Computer Sciences Corporation (CSC). The methods used to provide assurance that the system meets its security requirements include the system architecture, a system security evaluation, and the application of formal and informal verification techniques. The combination of state-of-the-art technology and the incorporation of new verification procedures results in a demonstration of the feasibility of computer security technology for operational applications. Author

A87-18852
AEROSPACE COMPUTER SECURITY CONFERENCE, 2ND, MCLEAN, VA, DECEMBER 2-4, 1986, TECHNICAL PAPERS
Conference sponsored by AIAA, American Society for Industrial Security, and DOD Computer Institute. New York, American Institute of Aeronautics and Astronautics, 1986, 142 p. For individual items see A87-18853 to A87-18865.
Copyright

Papers are presented on a model for the containment of computer viruses, the Commercial Communications Security Endorsement Program, and a design for a multilevel secure database management system. Topics discussed include secure computer systems, electronic mail privacy enhancement, multilevel data storage design, and secure database management system architectural analysis. Particular attention is given to access control and privacy in large distributed systems and the verification of integrity. I.F.

A87-18853#
A MODEL FOR THE CONTAINMENT OF COMPUTER VIRUSES
M. M. POZZO and T. E. GRAY (California, University, Los Angeles) IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 11-18. Research supported by the IBM Corp. refs
(Contract NSF MCS-81-21696)
(AIAA PAPER 86-2759) Copyright

This paper presents a mechanism for containing the spread of computer viruses by detecting at run-time whether or not an executable has been modified since its installation. The detection strategy uses an encrypted signature block approach and is held to be better for virus containment than conventional computer security mechanisms which are based on the incorrect assumption that preventing modification of executables by unauthorized users is sufficient. Although this mechanism is most effective when all executables in the system are signed, a scheme is presented that shows the usefulness of the signature block approach when this is not the case. Author

A87-18854#
INTEGRITY MECHANISMS IN A SECURE UNIX - GOULD UTX/32S
G. MILLER, S. SUTTON, M. MATTHEWS, J. YIP, and T. THOMAS

(Gould, Inc., Computer Systems Div., Urbana, IL) IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 19-26. refs
(AIAA PAPER 86-2761) Copyright

This paper examines an approach taken in designing a secure version of the UNIX operating system. This approach involves superimposing domains upon the UNIX file system, the addition of features that enable easy use of domains, and the enhancement of the integrity mechanisms that are already part of the UNIX operating system. Author

A87-18855#
A PRACTICAL DESIGN FOR A MULTILEVEL SECURE DATABASE MANAGEMENT SYSTEM

B. B. DILLAWAY and J. T. HAIGH (Honeywell Secure Computing Technology Center, Saint Anthony, MN) IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 44-57. refs
(Contract F30602-86-C-0003)
(AIAA PAPER 86-2771) Copyright

The problems inherent in the design of secure database management systems are described. Past attempts at solving these problems are reviewed briefly, and a new approach is described. It is based on the SAT type enforcement mechanism and two extensions to the basic SAT security policy. Author

A87-18856#
MULTILEVEL DATA STORE DESIGN

C. E. GARVEY and P. N. PAPACCIO (TRW, Inc., TRW Defense Systems Group, Redondo Beach, CA) IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 58-64. refs
(AIAA PAPER 86-2772) Copyright

The design and security model for the Multilevel Data Store (MLDS), which is based on a reference monitor approach, are proposed. The MLDS security model describes the protection that MLDS provides and defines the security rules it is required to enforce; the model is derived from the functional and security requirements of the Database Management System (DBMS). The trusted access methods of the DBMS, the untrusted user processes, the user log on steps, and the transaction and storage procedures are described. The database machine is utilized for the implementation of the MLDS. Consideration is also given to the row labels of the MLDS and the use of the high water-mark model for MLDS. I.F.

A87-18857#
SECURE DATABASE MANAGEMENT SYSTEM ARCHITECTURAL ANALYSIS

T. H. HINKE (System Development Corp., Santa Monica, CA) IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 65-72. refs
(Contract F30602-82-C-0093)
(AIAA PAPER 86-2773) Copyright

This paper is concerned with hardware/software architectures for secure database management systems (SDBMSs). Its specific focus is SDBMSs architectures that can support reference monitor security. It will look at the advantages and disadvantages of various types of proposed SDBMS architectures and the security technology needed to support them. It will then consider the implications of security requirements on various architectural approaches. Author

A87-18858#
GOOD SECURITY PRACTICES FOR I/S NETWORKS

L. W. MEHRMANN (IBM Corp., Irving, TX) IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 73-79.
(AIAA PAPER 86-2775) Copyright

Concepts for identifying and limiting security risks in information systems (I/O) networks are studied. The basic objectives of a good security program and network security are described. Network security risk and controls in an I/O environment are examined from a managerial prespective. The roles of physical access, logical access, organizational, personnel, operational, application development, and work station controls, and data transmission protection in the I/O environment are discussed; the operations of these controls in a specific network environment are considered. I.F.

A87-18860#
STRAWMAN DEFINITION FOR THE SPACE STATION INFORMATION SYSTEM NETWORK SECURITY

A. WHITE (Intermetrics, Inc., Huntington Beach, CA) IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 86-94. refs
(AIAA PAPER 86-2780) Copyright

The 'Strawman Definition for the Space Station Information System Network Security' provides an initial look at the security measures proposed for the Space Station Program. The paper analyzes security issues facing the design of the Space Station. A network security model for the Space Station Information System is introduced and security objectives are established. Recommendations for Space Station security are proposed to protect NASA and its customers. The paper serves as a baseline for further discussion. Author

A87-18861*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
ACCESS CONTROL AND PRIVACY IN LARGE DISTRIBUTED SYSTEMS

B. M. LEINER and M. BISHOP (NASA, Ames Research Center, Moffett Field, CA) IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 95-98. Previously announced in STAR as N86-29568.
(Contract NCC2-387)
(AIAA PAPER 86-2781) Copyright

Large scale distributed systems consists of workstations, mainframe computers, supercomputers and other types of servers, all connected by a computer network. These systems are being used in a variety of applications including the support of collaborative scientific research. In such an environment, issues of access control and privacy arise. Access control is required for several reasons, including the protection of sensitive resources and cost control. Privacy is also required for similar reasons, including the protection of a researcher's proprietary results. A possible architecture for integrating available computer and communications security technologies into a system that meet these requirements is described. This architecture is meant as a starting point for discussion, rather that the final answer. Author

A87-18863#
COMPUTER SECURITY ACQUISITION MANAGEMENT

H. O. LUBBES and B. STAUFFER IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 114-119.
(AIAA PAPER 86-2774) Copyright

Implementing computer security into the procurement of a Mission Critical System (MCS) is a life cycle process. The process begins with the definition of security requirements during Concept Exploration and continues through deployment to Accreditation of the installation. Throughout, the project manager is faced with technical trade-off decisions, financial issues and perhaps changing functional requirements. This paper presents a consistent life cycle view of the computer security management functions involved in acquisition of MCS. Author

A87-18864#
STATE-OF-THE-ART IN COMPUTER SECURITY FOR DOD SPACE SYSTEMS
D. B. BAKER (Aerospace Corp., Los Angeles, CA) IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 120-125. refs
(AIAA PAPER 86-2778) Copyright

Because of priorities and constraints which must be considered in performing design trade studies, DoD space systems being fielded today often cannot take full advantage of the computer security technology evolving in the commercial marketplace for multilevel processing. The consolidated Space Operations Center is described as an example of current defense space system development, and its security design is examined relative to the state-of-the-art in trusted system development. A transition strategy to exploit multilevel processing technology is proposed. Author

A87-18865#
COMPUTER SECURITY AND USER AUTHENTICATION - OLD PROBLEMS, NEW SOLUTIONS
J.-C. SPENDER (Enigma Logic, Inc., Concord, CA) IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 126-132.
(AIAA PAPER 86-2760) Copyright

This paper discusses the use of hand-held authentication devices. The devices offer a new solution to the old problem of securely identifying computer users. The technology has two parts; the authentication device or 'key', and the software or firmware 'lock' that teaches a system to look for the key. The alternative lock and key interactions are explained. Some of the problems presented by the technology, designing keys, designing locks, managing the lock, finding where to locate the lock in the host system, and managing the population of keys, are addressed. User and organizational reactions to this technology, are discussed. Author

A88-22566#
EDUCATIONAL USES OF THE AEROSPACE DATABASE
BARBARA LAWRENCE (AIAA, New York) AIAA, Aerospace Sciences Meeting, 26th, Reno, NV, Jan. 11-14, 1988. 12 p. refs
(AIAA PAPER 88-0749) Copyright

The underutilization of the aerospace literature and its importance in maintaining the competitiveness of the aerospace engineer and the industry is discussed. Use of the computerized Aerospace Database to support the engineering educator, the educational process, and the student is described. This paper discusses use of the Aerospace Database, a comprehensive information resource, to brain students in literature value and computerized information retrieval. The AIAA/TIS program to help educators incorporate these concepts into their courses and various computerized aids for database searching are described. Author

A88-26209
APPLYING TECHNOLOGY TO SYSTEMS; AEROSPACE COMPUTER SECURITY CONFERENCE, 3RD, ORLANDO, FL, DEC. 7-11, 1987, TECHNICAL PAPERS
Conference sponsored by AIAA, American Society for Industrial Security, and IEEE. Washington, DC, American Institute of Aeronautics and Astronautics, 1987, 170 p. For individual items see A88-26210 to A88-26213.
Copyright

The present conference discusses the Secure Distributed Operating System project for the verification of hookup security, active vs. passive security models, an expert system for the classification and sanitizing of texts, developments in guidance for trusted computer networks, the interconnection of accredited systems, and engineering systems applicable to embedded multilevel secure operations. Also discussed are network covert channel analysis, NASA Space Station program threat and vulnerability analysis, criterion extension for distributed systems, a transport encapsulation security protocol, and the protection of sensitive systems and data in an open governmental agency. O.C.

A88-26210*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, FL.
SPACE STATION PROGRAM THREAT AND VULNERABILITY ANALYSIS
STEVEN D. VAN METER (NASA, Kennedy Space Center, Cocoa Beach, FL) and JOHN D. VEATCH (Science Applications International Corp., Safeguards and Security Div., McLean, VA) IN: Applying technology to systems; Aerospace Computer Security Conference, 3rd, Orlando, FL, Dec. 7-11, 1987, Technical Papers. Washington, DC, American Institute of Aeronautics and Astronautics, 1987, p. 104-107.
(AIAA PAPER 87-3082) Copyright

An examination has been made of the physical security of the Space Station Program at the Kennedy Space Center in a peacetime environment, in order to furnish facility personnel with threat/vulnerability information. A risk-management approach is used to prioritize threat-target combinations that are characterized in terms of 'insiders' and 'outsiders'. Potential targets were identified and analyzed with a view to their attractiveness to an adversary, as well as to the consequentiality of the resulting damage. O.C.

A88-26212*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE HACK ATTACK - INCREASING COMPUTER SYSTEM AWARENESS OF VULNERABILITY THREATS
JOHN QUANN (NASA, Goddard Space Flight Center, Greenbelt, MD) and PETER BELFORD (NYMA, Inc., Greenbelt, MD) IN: Applying technology to systems; Aerospace Computer Security Conference, 3rd, Orlando, FL, Dec. 7-11, 1987, Technical Papers. Washington, DC, American Institute of Aeronautics and Astronautics, 1987, p. 155-157.
(AIAA PAPER 87-3093) Copyright

The paper discusses the issue of electronic vulnerability of computer based systems supporting NASA Goddard Space Flight Center (GSFC) by unauthorized users. To test the security of the system and increase security awareness, NYMA, Inc. employed computer 'hackers' to attempt to infiltrate the system(s) under controlled conditions. Penetration procedures, methods, and descriptions are detailed in the paper. The procedure increased the security consciousness of GSFC management to the electronic vulnerability of the system(s). Author

A88-26213*# National Aeronautics and Space Administration, Washington, DC.
PROTECTING SENSITIVE SYSTEMS AND DATA IN AN OPEN AGENCY
DOUGLAS B. HUNT (NASA, Washington, DC) and FREDERICK G. TOMPKINS (Management Dimensions Corp., Hanover, MD) IN: Applying technology to systems; Aerospace Computer Security Conference, 3rd, Orlando, FL, Dec. 7-11, 1987, Technical Papers. Washington, DC, American Institute of Aeronautics and Astronautics, 1987, p. 158-166. refs
(AIAA PAPER 87-3092) Copyright

This paper focuses on the policy and definitional issues associated with providing adequate and reasonable levels of protection for sensitive systems and data in an agency whose basic charter mandates the open sharing of information and transfer of technology into the market economy. An information model based on current Federal regulatory issuances is presented. A scheme for determining sensitivity levels, based on a categorization taxonomy,is provided. Author

N84-21402# RAND Corp., Santa Monica, CA.
INFORMATION SYSTEMS, SECURITY AND PRIVACY
W. H. WARE Nov. 1983 20 p refs Presented at Subcomm. on Transportation, Aviation and Mater., Comm. on Sci. and Technology, U.S. House of Representatives, Washington, D.C., 24 Oct. 1983
(RAND/P-6930; AD-A145193) Avail: NTIS HC A03/MF A01

A brief overview concerning the security of information and computer systems was presented and the relationship between security and personal privacy was examined. Record keeping privacy concerns protecting personal information and controlling its use for authorized purposes. Computer security provides protective mechanisms that assure computer system safety and protect the stored information including access to that information. Defense environment security was contrasted with commercial security. Threats against Department of Defense security involve large technical and financial resources of major world powers while the industrial threat is comparatively minor and involves authorized individuals using the system for personal gain. Several suggestions for the improvement of security for computer software and the related systems are presented, including preparation of a standard government handbook listing preferred procedures for running a computer center, clarification of personal privacy laws, and vendor obligations regarding security safeguards. M.A.C.

N84-26317*# Mitre Corp., McLean, VA.
GUIDELINES FOR DEVELOPING NASA (NATIONAL AERONAUTICS AND SPACE ADMINISTRATION) ADP SECURITY RISK MANAGEMENT PLANS Final Report
F. G. TOMPKINS Aug. 1983 60 p refs
(Contract NASW-3425)
(NASA-CR-173564; NAS 1.26:173564; PB84-171321; MTR-83W123) Avail: NTIS HC A04/MF A01 CSCL 09/2

This report presents guidance to NASA Computer security officials for developing ADP security risk management plans. The six components of the risk management process are identified and discussed. Guidance is presented on how to manage security risks that have been identified during a risk analysis performed at a data processing facility or during the security evaluation of an application system. GRA

N84-26318*# Mitre Corp., McLean, VA.
GUIDELINES FOR DEVELOPMENT OF NASA (NATIONAL AERONAUTICS AND SPACE ADMINISTRATION) COMPUTER SECURITY TRAINING PROGRAMS Final Report
F. G. TOMPKINS May 1983 50 p refs
(Contract NASW-3425)
(NASA-CR-173562; NAS 1.26:173562; PB84-171339; MTR-83W68) Avail: NTIS HC A03/MF A01 CSCL 09/2

The report presents guidance for the NASA Computer Security Program Manager and the NASA Center Computer Security Officials as they develop training requirements and implement computer security training programs. NASA audiences are categorized based on the computer security knowledge required to accomplish identified job functions. Training requirements, in terms of training subject areas, are presented for both computer security program management personnel and computer resource providers and users. Sources of computer security training are identified. Author (GRA)

N84-28498# Department of Defense, Fort Meade, MD. Computer Security Center.
DEPARTMENT OF DEFENSE TRUSTED COMPUTER SYSTEM EVALUATION CRITERIA Final Report
15 Aug. 1983 110 p
(AD-A141304; CSC-STD-001-83) Avail: NTIS HC A06/MF A01 CSCL 09/2

Evaluation criteria that classify systems into four broad hierarchical divisions of enhanced security protection are defined. These provide a basis for the evaluation of the effectiveness of security controls built into automatic data processing (ADP) system products. Two types of requirements delineated for secure processing: (1) specific security feature requirements, and (2) assurance requirements. Although the criteria are application-independent, it is recognized that the specific security feature requirements may have to be interpreted when applying the criteria to specific applications or other special processing environments. The underlying assurance requirements can be applied across the entire spectrum of ADP system or application processing environments without special interpretation. Rationale and control objectives behind the criteria are provided as are guidelines for the development of secure systems using these criteria. Author (GRA)

N84-30736# System Development Corp., McLean, VA.
GUIDELINE FOR COMPUTER SECURITY CERTIFICATION AND ACCREDITATION. CATEGORY: ADP (AUTOMATIC DATA PROCESSING) OPERATIONS. SUBCATEGORY: COMPUTER SECURITY. FEDERAL INFORMATION PROCESSING STANDARDS Final Report, Jan. 1981 - Sep. 1982
W. NEUGENT and Z. G. RUTHBERG 27 Sep. 1983 94 p refs
(FIPS-PUB-102) Avail: NTIS HC A05/MF A01; also available in three ring binder, North American Continent price $6.25; all others write for quote CSCL 09/2

This guideline is intended for use by ADP managers and technical staff in establishing and carrying out a program and a technical process for computer security certification and accreditation of sensitive computer applications. It identifies and describes the steps involved in performing computer security certification and accreditation; it identifies and discusses important issues in managing a computer security certification and accreditation program; it identifies and describes the principal functional roles needed within an organization to carry out such a program; and it contains sample outlines of an Application Certification Plan and a Security Evaluation Report as well as a sample Accreditation Statement and sensitivity classification scheme. GRA

N84-30737*# Mitre Corp., McLean, VA. Metrek Div.
GUIDELINES FOR CONTINGENCY PLANNING NASA (NATIONAL AERONAUTICS AND SPACE ADMINISTRATION) ADP SECURITY RISK REDUCTION DECISION STUDIES Final Report
F. G. TOMPKINS Jan. 1984 64 p refs
(Contract NASW-3425)
(PB84-189836; MTR-83W203) Avail: NTIS HC A04/MF A01 CSCL 09/2

Guidance is presented to NASA Computer Security Officials for determining the acceptability or unacceptability of ADP security risks based on the technical, operational and economic feasibility of potential safeguards. The risk management process is reviewed as a specialized application of the systems approach to problem solving and information systems analysis and design. Reporting the results of the risk reduction analysis to management is considered. Report formats for the risk reduction study are provided. GRA

N84-31989# Hanford Engineering Development Lab., Richland, WA.
FUNDAMENTALS OF COMPUTER SECURITY
F. M. BERTING 4 Apr. 1984 6 p refs Presented at the 7th Intern. Conf. of Women Engr. and Sci., Washington, D.C., 17-24 Jun. 1984
(Contract DE-AC06-76FF-02170)
(DE84-011476; HEDL-SA-3128-FP; CONF-8406118-1) Avail: NTIS HC A02/MF A01

Computer systems manages must address the need for protecting important company information and programs used to process that information by computers. Not related to the government classified category, this data is anything that could cause loss or harm to the company if altered, destroyed, or divulged. Threats specific to computer systems, such as unauthorized access to, or improper use of such data must be addressed without spending more on protective measures than is risked. Procedures are available to estimate such risks. Actions of people pose far greater threats than fire, flood or major disasters. Protective measures, therefore, emphasize preventing people from doing harm, accidentally or maliciously, by keeping out the unauthorized, tracking the activities of the authorized, and maintaining back up copies of everything required for essential company operations. DOE

N84-32302# General Accounting Office, Washington, DC. Resources Community and Economic Development Div.
DEPARTMENT OF ENERGY'S ACTIVITIES TO LIMIT DISTRIBUTION OF CERTAIN UNCLASSIFIED SCIENTIFIC AND TECHNICAL INFORMATION
30 Mar. 1984 28 p
(PB84-189158; B8212184; GAO/RCED-84-129) Avail: NTIS HC A03/MF A01 CSCL 05/2

The Department of Energy is a major publisher of unclassified scientific and technical information. The Technical Information Center, the Department's repository, sends most of its unclassified information to the National Technical Information Service, which sells it to the public. However, some of the information is limited to distribution within the federal government because it involves nuclear safety matters; securing foreign research results; or protecting patentable, propietary, and other information. This report describes the Department's procedures and controls for determining, distributing, and accessing unclassified information that is not made available to the public. GRA

N85-19691# Committee on the Judiciary (U.S. House).
COMPUTER CRIME
Washington GPO 1984 83 p refs Hearings before the Subcomm. on Civil and Constitutional Rights of the Comm. on the Judiciary, 98th Congr., 1st Sess., 18 Nov. 1983
(GPO-30-544) Avail: Subcommittee on Civil and Constitutional Rights

Testimony addressing computer-related crime is presented and the question of the Federal interest in outlawing unauthorized use of private sector computer equipment or the information stored in computerized files is raised. The potential of computer technology and data exchange for jeopardizing the privacy rights or ownership interests of the individual users or subjects is also examined. M.G.

N85-21994# Committee on Science and Technology (U.S. House).
COMPUTER AND COMMUNICATIONS SECURITY AND PRIVACY
Washington GPO 1985 133 p refs Hearing before the Subcomm. on Transportation, Aviation and Mater. of the Comm. on Sci. and Technol., 98th Congr., 2nd Sess., No. 123, 24 Sep. 1984
(GPO-39-741) Avail: Subcommittee on Transportation, Aviation and Materials

Computer and communications security and privacy were discussed. Better ways for storage and making information available and at the same time protecting the information are explored. Computer management, automated systems, protection of data, government and industry relations computer fraud and crime, economic viability, certification, and professional ethics are addressed. E.A.K.

N85-24793# National Bureau of Standards, Gaithersburg, MD. Center for Programming Science and Technology.
SECURITY OF PERSONAL COMPUTER SYSTEMS: A MANAGEMENT GUIDE Final Report
D. D. STEINAUER Jan. 1985 66 p refs
(PB85-161040; NBS/SP-500/120; LC-84-601156) Avail: NTIS HC A04/MF A01; also available SOD HC as SN003-003-02627-1 CSCL 09/2

This document is a security guide for managers and users of personal computer systems. It describes the nature of information security problems involved in the use of personal and other small computer systems and provides guidance for addressing those problems. GRA

N85-28593*# Mitre Corp., McLean, VA. Metrek Div.
NASA GUIDELINES FOR ASSURING THE ADEQUACY AND APPROPRIATENESS OF SECURITY SAFEGUARDS IN SENSITIVE APPLICATIONS
F. G. TOMPKINS Sep. 1984 127 p refs
(Contract NASW-3425)
(NASA-CR-175489; NAS 1.26:175489; MTR-84W-00179) Avail: NTIS HC A07/MF A01 CSCL 09/2

The Office of Management and Budget (OMB) Circular A-71, transmittal Memorandum No. 1, requires that each agency establish a management control process to assure that appropriate administrative, physical and technical safeguards are incorporated into all new computer applications. In addition to security specifications, the management control process should assure that the safeguards are adequate for the application. The security activities that should be integral to the system development process are examined. The software quality assurance process to assure that adequate and appropriate controls are incorporated into sensitive applications is also examined. Security for software packages is also discussed. Author

N86-15208 Texas Univ., Austin.
A COMPARATIVE STUDY OF OCLC, INC. AND THE WASHINGTON LIBRARY NETWORK IN TWENTY-NINE PACIFIC NORTHWEST ACADEMIC LIBRARIES Ph.D. Thesis
B. L. DECOSTER 1984 241 p
Avail: Univ. Microfilms Order No. DA8513207

Two hundred and two surveys were mailed to librarians at twenty-nine Pacific Northwest academic libraries that were members of either the Washington Library Network or OCLC, Inc. The librarians were asked to rate their degree of satisfaction with twenty-one aspects of their bibliographic database and the degree of usefulness of twenty-four database capabilities, regardless of their current availability, on a five-point Likert-type scale. One hundred fifty-five (77 percent) of the librarians responded. Chi-square tests were used to compare their responses. In an overall satisfaction rating, WLN librarians were significantly more satisfied with their bibliographic database than were the OCLC librarians. WLN librarians rated significantly higher than the usefulness of the abilities to order materials online from vendors and to perform title keyword searches. OCLC librarians rated significantly higher the usefulness of the abilities to perform interlibrary load transactions online, to limit searches by date(s), and to limit searches by format. WLN librarians rated satisfaction with the number of access points available to them significantly higher than did OCLC librarians. OCLC librarians rated their training manuals significantly higher. Dissert. Abstr.

N86-15919# Committee on Science and Technology (U.S. House).
COMPUTER SECURITY POLICIES
Washington GPO 1985 182 p refs Hearing before the Subcommittee on Transportation, Aviation and Materials of the Committee on Science and Technology, 99th Congr., 1st Sess., no. 26, 27 Jun. 1985
(GPO-52-154) Avail: Subcommittee on Transportation, Aviation and Materials

A congressional hearing was conducted and expert testimony heard on the subject of computer security policies. G.L.C.

N86-19950*# National Aeronautics and Space Administration. Langley Research Center, Hampton, VA.
A PROCESS ACTIVITY MONITOR FOR AOS/VS
R. A. MCKOSKY (Rockwell International), S. W. LINDLEY (Rockwell International), and J. S. CHAPMAN Washington Jan. 1986 30 p
(NASA-TM-86535; NAS 1.15:86535) Avail: NTIS HC A03/MF A01 CSCL 09/2

With the ever increasing concern for computer security, users of computer systems are becoming more sensitive to unauthorized access. One of the initial security concerns for the Shuttle Management Information System was the problem of users leaving their workstations unattended while still connected to the system. This common habit was a concern for two reasons: it ties up resources unnecessarily and it opens the way for unauthorized access to the system. The Data General MV/10000 does not come equipped with an automatic time-out option on interactive peripherals. The purpose of this memorandum is to describe a

system which monitors process activity on the system and disconnects those users who show no activity for some time quantum. Author

N86-24562# DOD Security Review Commission, Washington, DC.
KEEPING THE NATION'S SECRETS: A REPORT TO THE SECRETARY OF DEFENSE BY THE COMMISSION TO REVIEW DOD SECURITY POLICIES AND PRACTICES Final Report
R. G. STILWELL 19 Nov. 1985 121 p
(AD-A161998) Avail: NTIS HC A06/MF A01 CSCL 05/1

The report contains an introduction, executive summary, overview and a three part report with sixty-three recommendations for change in DoD security policies and procedures related to the protection of classified material. Policy and Procedures, the first section of the report's main body, includes classified information access (clearances, investigations, adjudication, cryptographic controls, personnel supervisory evaluations and personnel information collection), managing and controlling classified information (classification, dissemination, transmission, retention and storage, special access program and international transfer agreements), and detecting anc countering hostile intelligence, security awareness, reporting of possible espionage, and detecting and investigating security violators). Management and execution, the second part of the report, includes command emphasis, organizational arrangements, research, training, career development and program oversight. Resource management is the third and final section of the report. GRA

N86-25140# National Bureau of Standards, Gaithersburg, MD. Center for Programming Science and Technology.
TECHNOLOGY ASSESSMENT: METHODS FOR MEASURING THE LEVEL OF COMPUTER SECURITY Final Report, 1980 - 1981
W. NEUGENT, J. GILLIGAN, L. HOFFMAN, and Z. G. RUTHBERG 1985 208 p Prepared in cooperation with System Development Corp., McLean, Va. and George Washington Univ., Washington, D.C.
(PB86-129954; NBS/SP-500/133; LC-85-600600) Avail: NTIS HC A10/MF A02; also available SOD HC $8.00 as SN003-003-02686-7 CSCL 09/2

The document is a companion to FIPS PUB 102, Guideline for Computer Security Certification and Accreditation. Since a security certification depends upon a technical security evaluation, this document is meant to provide information on twenty-five evaluation methods in common use today in the security, EDP audit, and risks analysis communities. GRA

N86-29568*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, CA.
ACCESS CONTROL AND PRIVACY IN LARGE DISTRIBUTED SYSTEMS
B. M. LEINER and M. BISHOP 7 Mar. 1986 18 p
(Contract NCC2-387)
(NASA-TM-89397; RIACS-TR-86.6; NAS 1.15:89397) Avail: NTIS HC A03/MF A01 CSCL 09/2

Large scale distributed systems consists of workstations, mainframe computers, supercomputers and other types of servers, all connected by a computer network. These systems are being used in a variety of applications including the support of collaborative scientific research. In such an environment, issues of access control and privacy arise. Access control is required for several reasons, including the protection of sensitive resources and cost control. Privacy is also required for similar reasons, including the protection of a researcher's proprietary results. A possible architecture for integrating available computer and communications security technologies into a system that meet these requirements is described. This architecture is meant as a starting point for discussion, rather that the final answer. Author

N87-12397# Office of Technology Assessment, Washington, DC.
FEDERAL GOVERNMENT INFORMATION TECHNOLOGY: MANAGEMENT, SECURITY AND CONGRESSIONAL OVERSIGHT
Feb. 1986 190 p
(PB86-205499; OTA-CIT-297; LC-86-600507) Avail: NTIS HC A09/MF A01 CSCL 05/2

Five major issues are addressed: management of information technology, including strategic planning, innovation, procurement, and the information resources management (IRM) concept; informantion systems security and computer crime; information technology and decision support; management of government information dissemination; and opportunities for using information technology in conducting congressional oversight. GRA

N87-23151# Sandia National Labs., Albuquerque, NM.
CONSIDERATIONS IN DEVELOPING A COMPREHENSIVE COMPUTER SECURITY SUPPORT DATABASE SYSTEM
J. J. CLEVER 1987 18 p Presented at the Department of Energy Computer Security Group Conference, Albuquerque, N. Mex., 5 May 1987
(Contract DE-AC04-76DP-00789)
(DE87-005527; SAND-86-2543C; CONF-870565-1) Avail: NTIS HC A03/MF A01

In the past several years, computer technology has mushroomed on all fronts. This has resulted in the computer security professional encountering the problem of an ever increasingly complex demand for control, audit, and countermeasure efforts, with concomitantly greater demands on scarce personal time. This paper examines the background of the problem in the practical context of an existing larger organization. It then looks at some of the managerial, technical and economic considerations involved in achieving a higher level of individual productivity at minimal personnel costs. In this instance, the methodology reviewed considerations for developing support from an automated database. Finally, it provides an overview of the database schema, a summary of the initial applications design, and a review of some concerns encountered at implementation of the concept. DOE

N87-23152# Sandia National Labs., Albuquerque, NM.
ELEMENTS OF A PROPOSED SECURITY METHODOLOGY FOR NETWORKS OF COMPUTERS
L. G. PIERSON and E. L. WITZKE Oct. 1986 13 p
(Contract DE-AC04-76DP-00789)
(DE87-006769; SAND-86-2453) Avail: NTIS HC A03/MF A01

Described are the components or elements of a proposed security methodology for networks of computers. This general security methodology separates the security life of a computer network into two phases; the design, review, and accreditation phase, and the operational phase. The first phase deals with system security planning, implementation, certification, and accreditation for operation. The second phase deals with the processing of unusual events which may be of security interest during the operation of a computer network. The unusual events are processed through a series of filters to determine if the event is associated with a loss or unauthorized activity. Detection and processing of certain kinds of unusual events may cause the update and review of the elements in the first phase (design, review, and accreditation). DOE

N87-24232# Lawrence Livermore National Lab., CA.
LIVERMORE RISK ANALYSIS METHODOLOGY: A QUANTITATIVE APPROACH TO MANAGEMENT OF THE RISK ASSOCIATED WITH THE OPERATION OF INFORMATION SYSTEMS
S. B. GUARRO, A. A. GARCIA, C. C. WOOD, and P. G. PRASSINOS 14 Aug. 1986 18 p Presented at the Computer and Communications Security Conference, New York, N.Y., 7 Oct. 1986
(Contract W-7405-ENG-48)

(DE87-006828; UCRL-95133; CONF-8610255-1) Avail: NTIS HC A03/MF A01

Risk assessment methods vary in nature and depth. Their application to the evaluation of information security issues should be decided on the basis of their capability to provide answers to practical and fundamental questions concerning the design and implementation of security controls in specific information systems. Quantitative risk analysis provides an objectively based approach to the problem of assessing and managing risk. As a decision making and risk assessment tool, it is not only capable of identifying potential losses that could be unacceptable for a given system, but it can be used to determine which specific security controls and countermeasures can be effective and cost justifiable. The Livermore Risk Analysis Methodology (LRAM) was developed to cover these objectives in a balanced and comprehensive way. Its model and procedures, from the identification of valuable assets to the prioritization and budgeting of proposed controls, are examined and discussed both from the technical and from the decision making/risk management perspectives. DOE

N87-27550# Defense Technical Information Center, Alexandria, VA. Office of Information Systems and Technology.
ARTIFICIAL INTELLIGENCE DEVELOPMENTS RE: DOD GATEWAY INFORMATION SYSTEM (DGIS) AND DEFENSE APPLIED INFORMATION TECHNOLOGY CENTER (DAITC)
ALLAN D. KUHN Feb. 1987 19 p
(AD-A181101; DTIC/TR-87/9; DTIC-AI-FOUNDATIONAL-SER-2)
Avail: NTIS HC A03/MF A01 CSCL 05/2

The artificial intelligence (AI) activities of the DGIS and DAITC are summarized. AI-like developments are discussed as precursors to true AI activity. The DGIS is presented as a low-level AI-like system, which attempts to mimic human responses. The DAITC is now being established as an information technology resource for DOD. The missions of the individual DAITC laboratories are described. These laboratories will study applications of AI, high density storage, interconnectivity, video laser disk, and human factors. The overall objective of implementing AI applications will be to make the human-machine interface more human-like. GRA

N88-20210# Office of Technology Assessment, Washington, DC.
DEFENDING SECRETS, SHARING DATA: NEW LOCKS AND KEYS FOR ELECTRONIC INFORMATION
Oct. 1987 191 p
(PB88-143185; OTA-CIT-310) Avail: NTIS HC A09/MF A01; also available SOD HC $8.50 as 052-000-010-83-6 CSCL 05/2

Federal policies directed at protecting information, particularly in electronics communications systems are examined. Also examined are the vulnerability of communications and computer systems, and the trends in technology for safeguarding information in these systems. The primary activities and motivations of stakeholders such as banks, government agencies, vendors and standards developers to generate and use safeguards are reviewed. The focus is on issues stemming from possible conflicts among Federal policy goals and important trends taking place in the private sector are addressed. GRA

N88-22542# Los Alamos National Lab., NM.
MONITORING THE USAGE OF A COMPUTER SYSTEM
D. J. BAILEY Nov. 1987 14 p Presented at the IEEE Symposium on Security and Privacy, Oakland, Calif., 1 Apr. 1988
(Contract W-7405-ENG-36)
(DE88-004310; LA-UR-87-4103; CONF-880456-1) Avail: NTIS HC A03/MF A01

Controlling the usage of computer systems particularly those operated for the Federal government, is an important topic today. Audit requirements have grown to the point where they can be a significant burden to the proprietors of the system. The paper briefly mentions several proposals for responding to increased audit requirements and for monitoring a system to detect unauthorized activity. A technique is proposed for situations where the proscribed or the intended activity can be characterized in terms of program or system performance parameters. The design of a usage monitoring system is outlined. The design is based on enhancing the audit data provided by the monitored system, capturing the audit data in a separate system to protect it from user access, and implementing one of the audit trail analysis systems currently under development. DOE

N88-25163# Transportation Systems Center, Cambridge, MA.
COMPUTER RESOURCE MANAGEMENT TECHNOLOGY PROGRAM (PE 64740F). TASK NO. 9: ADVANCED USER AUTHENTICATION Final Report, May - Nov. 1987
L. WATSON and W. BARRON Mar. 1988 125 p Sponsored by the Air Force, Hanscom AFB, Mass.
(PB88-183066; DOT-TSC-RSPA-88-1; DOT-VA846-88-1) Avail: NTIS HC A06/MF A01 CSCL 09/2

The various technologies which can be used to perform user authentication are examined with an emphasis on biometric techniques. The methods by which each device performs the authentication of users are examined individually, and their suitability for a multilevel computer environment is assessed. The status and direction of computer user authentication devices and techniques, in general, are evaluated. Included are independent testing results, government requirements, selection considerations, and a glossary of computer security and user authentication terminology. Author

N84-73042# California Univ., Los Angeles. Dept. of Computer Science.
SECURE DISTRIBUTED PROCESSING SYSTEMS Quarterly Technical Reports, 1 Jul. 1977 - 30 Apr. 1978
G. J. POPEK Jun. 1978 31 p
(Contract MDA903-77-C-0211; ARPA ORDER 3396)
(AD-A134935; UCLA-SDPS-78-002)

N85-70325*# Mitre Corp., McLean, VA.
GUIDELINES FOR CERTIFICATION OF EXISTING SENSITIVE SYSTEMS Final Report
P. A. GIRAGOSIAN, D. W. MASTBROOK, and F. G. TOMPKINS Jul. 1982 45 p refs
(Contract NASW-3425)
(NASA-CR-174080; NAS 1.26:174080; PB84-232122; MTR-82W18)

N85-72106 General Services Administration, Washington, DC.
GSA AUTOMATED INFORMATION SECURITY
29 Oct. 1984 24 p
(PMS-P-2100.1-CHGE-1)

N85-72650 General Services Administration, Washington, DC. Office of Policy and Management Systems.
GSA AUTOMATED INFORMATION SECURITY
W. A. CLINKSCALES 19 Apr. 1984 77 p
(PMS-P-2100.1)

N85-74089# Sytek, Inc., Mountain View, CA.
SECURITY CONCEPTS FOR MICROPROCESSOR BASED KEY GENERATOR CONTROLLERS Final Report, 30 Sep. 1982 - 31 Mar. 1984
R. K. BAUER, R. J. FEIERTAG, B. L. KAHN, and W. F. WILSON 24 Apr. 1984 73 p
(Contract MDA904-82-C-0449)
(AD-A155194; SYTEK-TR-84009)

N85-74267# Mitre Corp., Bedford, MA.
THE TRUSTED FUNCTION IN SECURE DECENTRALIZED PROCESSING Technical Report
P. T. WITHINGTON Sep. 1979 43 p
(Contract F19628-79-C-0001; ARPA ORDER 3338)
(AD-A155252; MTR-3892)

N85-74342 General Accounting Office, Washington, DC.
TELECOMMUNICATIONS SECURITY AND PRIVACY
W. G. REED 17 Oct. 1983 31 p refs

N88-70733 Oak Ridge Gaseous Diffusion Plant, TN. Computing and Telecommunications Div.
USING BAR CODE TECHNOLOGY TO ENHANCE CLASSIFIED DOCUMENT ACCOUNTABILITY
PATRICK J. MOUNTAIN and DONALD J. WADE *In* DOE/Contractors Micrographics and Information Association, Proceedings of the 14th Annual Conference of the DOE/Contractors Micrographics and Information Information Management Association 44 p 1986
(Contract DE-AC05-84OR-21400)
Avail: NTIS

INTELLECTUAL PROPERTY

Rights to information and data are a complex, and often sore subject for both the Federal and private sectors. IRM managers have to be versed in the legal and policy issues, and agile at avoiding pitfalls, as well as taking advantage of available practices.

A84-22341*# National Aeronautics and Space Administration, Washington, DC.
SPACE SHUTTLE, PRIVATE ENTERPRISE AND INTELLECTUAL PROPERTIES IN THE CONTEXT OF SPACE MANUFACTURING
S. N. HOSENBALL and R. F. KEMPF (NASA, Washington, DC) IN: Manufacturing in space; Proceedings of the Winter Annual Meeting, Boston, MA, November 13-18, 1983. New York, American Society of Mechanical Engineers, 1983, p. 149-160.
Copyright

It is a national policy to make the capabilities of the Space Transportat ion System available to a wide range of potential users. This includes its availability as a space manufacturing facility for commercial activities, which may be carried out on a reimbursable basis or as a joint endeavor with NASA, but with substantial private investment. In any high risk, long lead-time research and development activity directed towards commercialization, the protection afforded the results of the research and development under the laws relating to intellectual property rights may provide an important incentive for private investment. The paper reviews NASA's policies and practices for the protection of privately-established intellectual property rights involved in STS use, with particular emphasis on reimbursable launch agreements and joint endeavor agreements. Author

A85-29025
COLLOQUIUM ON THE LAW OF OUTER SPACE, 27TH, LAUSANNE, SWITZERLAND, OCTOBER 7-13, 1984, PROCEEDINGS
Colloquium sponsored by the International Astronautical Federation. New York, American Institute of Aeronautics and Astronautics, 1985, 426 p. No individual items are abstracted in this volume.
Copyright

Selected aspects of space law are examined in reviews and reports. Topics discussed include space law and domestic law, space activities and intellectual property (including industrial property), nuclear power sources in outer space, legal aspects of large space structures, conditions essential for maintaining outer space for peaceful uses, and the impact of present and expected uses of outer space on the space environment. Consideration is given to U.S. law applying to land remote sensing, U.S.-government authorization and supervision of nongovernmental space activities, space law and the concepts of Roman law, patent law activities of states in industrial-property technology cooperation, prospects for the demilitarization of manned space stations, jurisdiction problems of large space systems, large structures on the moon, legal measures for the prevention of an arms race in space, collision probabilities in the geostationary ring, and the indivisibility of environmental protection in vertical space. T.K.

A85-49972
INTELLECTUAL PROPERTY AND SPACE ACTIVITIES
B. LUXENBERG (U.S. Department of Commerce, Washington, DC) and G. J. MOSSINGHOFF (Pharmaceutical Manufacturers Association, Washington, DC) Journal of Space Law, vol. 13, no. 1, 1985, p. 8-21. refs
Copyright

The need for protection of data, products, and ideas as the commercialization of space continues is discussed. Some of the international and national laws of space which govern proprietary information and commercialization are presented. The development of laws to protect copyrighted works transmitted by satellite and remote sensing is described. NASA's policy toward intellectual property rights is to protect proprietary interests and encourage industrial participation in commercial space activities. Explanations of these policies are provided. The future property rights to possible inventions made by reimbursable users on the Space Shuttle and the Space Station are examined. I.F.

A86-34121#
ADJUSTING LEGAL REGIMES TO NEW COMMERCIAL REALITIES
D. J. BURNETT (Benner, Burnett and Coleman, Washington, DC) IN: U.S. Opportunities in Space Conference; Proceedings of the Second Annual Space Business Conference, Washington, DC, October 30-November 1, 1985. London, Space Consultants International, Ltd., 1985, 19 p.

Legal issues regarding multinational commercial space activities are discussed. The formation of international laws or agreements concerning financial and technical support for multinational space activities, the intellectual property rights for technologies developed as part of a multinational space project, and the protection of national security and state sovereignty is examined. The intergovernmental agreements need to be multilateral and issued from the highest government official. I.F.

A86-43349
ASPECTS OF LAW AND PRACTICE IN THE UNITED STATES
B. LUXENBERG (DOC, Washington, DC) IN: Space stations: Legal aspects of scientific and commercial use in a framework of transatlantic cooperation; Proceedings of the International Colloquium, Hamburg, West Germany, October 3, 4, 1984. Cologne, West Germany, Carl Heymanns Verlag, 1985, p. 175-185. refs
Copyright

The establishment of a permanently orbiting space station will usher in a new era, in which a significant shift will occur toward private entrepreneurial activity in space. However, in order to provide an incentive to private entities to engage in such ventures, the protection of intellectual property resulting from space station activities must be assured. The international law of outer space is considered along with developments regarding intellectual property rights in the case of NASA, commercial activities in space, national policy on space commercialization, and issues for the future. It is pointed out that NASA has developed flexible legal arrangements for companies pursuing commercial space ventures in the shuttle era and that this policy will undoubtedly carry over into the space station. G.R.

A87-18859#
PROTECTION OF INTELLECTUAL PROPERTY IN SPACE
J. L. LANDENBERGER (Booz, Allen and Hamilton, Inc., Bethesda, MD) IN: Aerospace Computer Security Conference, 2nd, McLean, VA, December 2-4, 1986, Technical Papers. New York, American Institute of Aeronautics and Astronautics, 1986, p. 80-85. refs
(AIAA PAPER 86-2779) Copyright

This paper addresses issues concerning the protection of intellectual property in the space industry, for the Space Shuttle and Space Station. The author defines intellectual property and discuses the current functional and security environments of the Space Shuttle and the proposed Space Station. The protection of intellectual property is defined as a fundamental operational consideration in the Space Shuttle and Space Station because corporations and international users will provide confidential and

proprietary data to operating teams and crews in order to conduct onboard experiments. The author also addresses the fact that onboard defense missions require intellectual property protection to protect national security. The paper concludes by identifying methods for improving the protection of intellectual property in the Space Station environment. Author

A87-34597
THE STATION IS RAISING LOTS OF QUESTIONS ABOUT SPACE LAW
Commercial Space (ISSN 8756-4831), vol. 2, no. 4, Winter 1987, p. 43, 45.
Copyright

The U.S./international space station program may give rise to unprecedented legal questions when it becomes operational, questions involving disputes opver such things as criminal activity on the station, industrial espionage, intellectual property rights in space, export law, and product liability. agreements among the four space partners - the U.S., Canada, Japan, and the European Space Agency - are needed to clarify the legal questions. Experts believe that some existing laws can be transferred to space, but others will be inapplicable. If the U.S. were to assert sole jurisdiction over the station, other countries could choose to withdraw their participation. Having 'national enclaves' aboard the station is unacceptable to the U.S. Setting up an international governmental organization, such as Intelsat, might be a possibility. A measure to extend U.S. patent laws to cover devices invented aboard launch vehicles and spacecraft is expected to be brought up again during the current legislative session. Although some members of Congress are concerned about adequate protection of U.S. interests, some experts think it would be best to wait and write the laws when the need for them is specifically evident. Author

A88-19830
REMOTE SENSING AND THE FIRST AMENDMENT
MARK E. BRENDER (American Broadcasting Co., Washington, DC) Space Policy (ISSN 0265-9646), vol. 3, Nov. 1987, p. 293-297.
Copyright

The strict licensing requirements for remote-sensing satellites imposed by the U.S. Land Remote Sensing Commercialization Act (LRSCA) of 1984 (as implemented by rules and regulations published in August 1987) are examined critically from the standpoint of the news media. Consideration is given to the improved resolution of present satellites, the value of up-to-date satellite imagery for news reporting, proposals for a private-vendor or consortium sponsored Mediasat with resolution even better than that of SPOT (10 m), the commercial viability of a Mediasat, the possible impact of a Mediasat on the national security of the U.S. and other nations, and the specific provisions of LRSCA. It is argued that LRSCA is both (1) too vague (permitting denial of licenses on intervention of the DOD or State Department, but leaving the key terms 'national security and foreign policy interests' undefined) and (2) in violation of the First Amendment rights of the media to gather news. T.K.

A88-19831
GATHERING NEWS FROM SPACE
RICHARD DALBELLO and RAY A. WILLIAMSON (U.S. Congress, Office of Technology Assessment, Washington, DC) Space Policy (ISSN 0265-9646), vol. 3, Nov. 1987, p. 298-306. refs
Copyright

Developments in remote-sensing technology have prompted suggestions that the news media could soon make routine use of newsgathering from space. A satellite system dedicated to this purpose (a 'Mediasat') could supply critical information. Government policy makers, however, fear that media use of such technology could affect national security, foreign relations, and personal privacy. This article assesses U.S. government policy on current and future newsgathering from space, and the technical potential for a Mediasat system. The authors raise doubts about the commercial viability of Mediasat, and point out that existing media sources already provide information on news stories. They conclude that concerns over the use of data from space will have to be met on a case-by-case basis as the media gain experience, using the same criteria now applied to balance the right to freedom of information with the need for national security. Author

A89-12126#
INTERNATIONAL SPACE LAW NORMS REGULATING REMOTE SENSING OF THE EARTH FROM OUTER SPACE
CHARLES CHUKWUMA OKOLIE (Okolie International Law Chambers, Chicago, IL) IN: Colloquium on the Law of Outer Space, 30th, Brighton, England, Oct. 10-17, 1987, Proceedings. Washington, DC, American Institute of Aeronautics and Astronautics, 1988, p. 366-370. refs
Copyright

The applicability of international customary law and treaties to commercial satellite remote sensing of earth resources is examined. The history of space remote sensing is briefly traced, and the applicable UN legislation is characterized in detail. It is argued that currently valid international law, while permitting remote-sensing activities without the consent of the states whose territory is being observed, demands that the states with jurisdiction over the remote-sensing operators encourage them to make the remote-sensing information available to the observed states. T.K.

A89-17871#
INTERNATIONAL SPACE PLANS AND POLICIES - FUTURE ROLES OF INTERNATIONAL ORGANIZATIONS
STEPHEN E. DOYLE (Aerojet TechSystems Co., Sacramento, CA) IAF, International Astronautical Congress, 39th, Bangalore, India, Oct. 8-15, 1988. 14 p. refs
(IAF PAPER 88-622) Copyright

The role of international organizations in international space plans and policy is discussed, including branches of the UN, scientific and technical organizations, and intergovernmental operating global systems. National, regional, and global organizations affecting space activities are outlined. The future needs of space activity are examined, including standardization of astronautic cartography, mission safety practices, health and contamination controls, the definition and policing of criminal activity, and issues of personal status and nationality. The creation of a world space agency within the structure of the UN is proposed to control international space activities. R.B.

A89-33030
LEGAL PROBLEMS POSED BY THE COMMERCIALIZATION OF DATA COLLECTED BY THE EUROPEAN REMOTE SENSING SATELLITE ERS-1
MICHEL BOURELY Journal of Space Law (ISSN 1012-3431), vol. 16, no. 2, 1988, p. 129-146. refs
Copyright

Legal issues related to the commercialization of remote sensing data from ERS-1 are examined. The general principles of remote sensing activities and the commercialization of Eosat, Landsat, SPOT, and Soviet satellite data are reviewed. The legal bases and technical aspects of the ERS-1 program are discussed. The specific rules in the framework of the ERS-1 program concerning the role of the ESA and the participating states in the operational phase are outlined. In addition, consideration is given to international laws which are applicable to the intellectual property regime and the dissemination of ERS-1 data. R.B.

N85-11013*# National Aeronautics and Space Administration, Washington, DC.
LEGAL CONSIDERATIONS AND COOPERATIVE OPPORTUNITIES FOR SPACE COMMERCIAL ACTIVITIES
S. N. HOSENBALL *In* NASA. Marshall Space Flight Center 2nd Symp. on Space Industrialization p 28-37 Oct. 1984
Avail: NTIS HC A19/MF A03 CSCL 05/4

It is a national policy to make the capabilities of the Space Transportation System available to a wide range of potential users. This includes its availability as a space manufacturing facility for commercial activities, which may be carried out on a reimbursable

basis or as a joint endeavor with NASA, but with substantial private investment. In any high risk, long lead-time research and development activity directed towards commercialization, the protection afforded the results of the research and development under the laws relating to intellectual property rights may provide an important incentive for private investment. The policies and practices of NASA directed towards the protection of privately-established intellectual property rights involved in STS use are reviewed with particular emphasis on reimbursable launch agreements and joint endeavor agreements. R.S.F.

N86-10586# Shock and Vibration Information Center (Defense), Washington, DC.
EDITORS RATTLE SPACE
R. E. ESHLEMAN, ed. *In its* The Shock and Vibration Digest, Vol. 17, No. 3 p 2 Mar. 1985
Avail: SVIC, Code 5804, Naval Research Lab., Washington, D.C. 20375 CSCL 05/2

The technology transfer process has developed rapidly during the past ten years to provide more knowledge to engineers at a faster rate. However, the distillation of the literature into handbooks and monographs has lagged the progress on information retrieval and short course performance. Up to now there is no magical, fast way to transform specialized technology from journals and reports into handbooks, tables, and computer data bases. The problem always arises on who will organize and pay for it. It is obvious that it requires joint efforts with the cost spread out over many companies. Today, no good means has been found to accomplish this process on a large scale basis. Author

N86-17230# Pacific Northwest Lab., Richland, WA.
TECHNOLOGY TRANSFER IS OPPORTUNITY TRANSFER
T. M. LEVINSON, L. C. SCHMID, and R. L. WATTS Jun. 1985 11 p Presented at the 10th Annual Meeting of the Technology Transfer Society, San Francisco, Calif., 24 Jun. 1985
(Contract DE-AC06-76RL-01830)
(DE85-016622; PNL-SA-12976; CONF-8506175-1) Avail: NTIS HC A03/MF A01

The management of intellectual property and the decision process of selecting federal technologies for transfer is approached from the perspective of how they can be packaged as business opportunities. The package is usually provided by a technologist who is the technology provider and the opportunity must be perceived as such by the business person. Thoughts are provided on the different perspectives of the technology provider and the technology seeker and the environment in which the transfer process occurs. The different perspectives and the environment can cause a disconnect between the research result and its uses. By using selection criteria based on the business person's perspective and by presenting the technology in terms of what it can become helps to mitigate this disconnect. DOE

N86-21458# Committee on Science and Technology (U.S. House).
TECHNOLOGY TRANSFER
Washington GPO 1985 258 p Hearings before the Subcommittee on Science, Research and Technology of the Committee on Science and Technology, 99th Congress, 1st Session, no. 22, 21-22 May 1985
(GPO-49-539) Avail: Subcommittee on Science, Research and Technology

The Congressional Subcommittee on science, research and technology held hearings on primarily technology transfer. The legislation was proposed on: utilization of federal technology basic research, commercializing intellectual property, technology utilization, stimulation of global competition, improvement of city services, stimulation of local economics, Federal commercial cooperation, and technology transfer from Government to private sector. E.A.K.

N86-27130# Congressional Research Service, Washington, DC. Office of Senior Specialists.
PUBLIC LAWS OF THE 98TH CONGRESS RELATING TO INFORMATION POLICY
S. N. MILEVSKI 14 Mar. 1986 101 p
(CRS-TK-7885-F) Avail: NTIS HC A06/MF A01

Statutes of the 98th Congress treating information related concerns are enumerated. Limited to public laws of a substantive nature, the topical overview of areas of congressional concern is divided into nine sections: Federal Information Resources Management; International Communications and Information Policy; Telecommunication, Broadcasting, and Satellite Transmission; Intellectual Property; Library and Archives Policies; Information Disclosure, Confidentiality and the Right of Privacy; Computer Security and Crime; Information Technology for Education, Innovation, and Competitiveness; and Government Information Systems, Clearinghouses, and Dissemination. Brief considerations of parallel developments in the executive branch and private sector for 1983 to 1984 are included, along with significant laws from the 95th through 97th Congresses. The appendix provides a compilation of information policy public laws, 1977 through 1984. Author

N87-21754# Office of Technology Assessment, Washington, DC.
SPACE STATIONS AND THE LAW: SELECTED LEGAL ISSUES
Sep. 1986 88 p
(PB87-118220; OTA-BP-ISC-41; LC-86-600569) Avail: NTIS HC A05/MF A01 CSCL 05/4

Part 1 is a background paper which discusses the legal consequences of developing and operating the space station. This paper examines the different ways in which a multinational space station might be owned and operated and explains how each could affect the rights and responsibilities of the U.S. Government and its citizens. In addition, it gives special attention to the application of jurisdiction, tort law, intellectual property, and criminal law to nations and individuals living and working in space. Part 2 of this report is a summary of the workshop held by OTA to critique and expand on the initial drafts of Part 1. GRA

N88-10695# RAND Corp., Santa Monica, CA.
NEW TECHNOLOGIES AND INTELLECTUAL PROPERTY: AN ECONOMIC ANALYSIS
STANLEY M. BESEN May 1987 81 p
(Contract NSF IST-84-15297)
(N-2601-NSF) Avail: NTIS HC A05/MF A01

A greater understanding was developed of how new information and communications technologies may affect the economic system in which knowledge based products and services are created, produced, packaged, distributed, and used. Examined are (1) the economic basis for the systems of private property rights in intellectual property, copyrights, patents, and trade secrets; (2) the economic behavior of producers of intellectual property; (3) the effects of new technologies on that behavior; (4) the effects of the legal treatment of authors, publishers, packagers, distributors, and users; (5) the issues involved in estimating the harm to producers of intellectual property that results from the introduction of new technologies; and (6) various types of government intervention that may be used to promote the supply of intellectual property. Author

N89-12496# Committee on Science, Space and Technology (U.S. House).
INTERNATIONAL SPACE POLICY FOR THE 1990'S AND BEYOND, NO. 86
Washington GPO 1988 132 p Hearing before the Committee on Science, Space, and Technology, 100th Congr., 1st Sess., 10 Dec. 1987
(GPO-82-156) Avail: Subcommittee on Space Science and Applications, House of Representatives, Washington, D.C. 20510 HC free

The Subcommittee on Space Science and Applications of the Committee on Science, Space and Technology of the U.S.

House of Representatives met on 10 December, 1987, to discuss International Space Policy for the 1990's and Beyond. Expert witness was given by Herman Pollack, Chairman, NASA Advisory Council Task Force on International Relations in Space, Dr. James C. Fletcher, NASA Administrator, Michael Michaud, Acting Deputy Assistant Secretary for Science and Technology, Department of State, and Jerry Grey, Director, Science and Technology Policy, American Institute of Aeronautics and Astronautics. F.M.R.

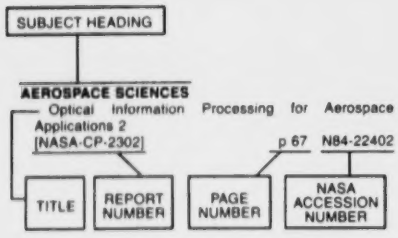
N89-13306# Los Alamos National Lab., NM.
UNITED STATES SPACE POLICY: REVIEW AND ASSESSMENT
PATRICK J. GARRITY Jun. 1988 40 p
(Contract W-7405-ENG-36)
(DE88-015538; LA-11181; CNSS-3) Avail: NTIS HC A03/MF A01

This report summarizes two key documents that reflect official U.S. space policy: (1) the January 1988 Presidential directive on overall U.S. national space policy; and (2) the February 1987 Department of Defense space policy. The report examines various U.S. military, civilian, commercial, and arms control activities as they relate to space. DOE

N89-16609*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, MD.
THE IUE DATA BANK: STATISTICS AND FUTURE ASPECTS
MARION SCHMITZ and MICHAEL BARYLAK (European Space Agency. ESA Tracking Station, Madrid, Spain) *In* ESA, Proceedings of the Celebratory Symposium on a Decade of UV Astronomy with the IUE Satellite, Volume 2 p 369-372 Jun. 1988
Copyright Avail: NTIS HC A19/MF A03

The data exchange policy between Goddard Space Flight Center and ESA's Villafranca (Spain) station is described. The IUE data banks and their uses are outlined. Statistical information on objects observed, the quantity of data distributed and retrieved from the archives, together with a detailed design of the final format of the IUE merged log are also given. ESA

Typical Subject Index Listing



The subject heading is a key to the subject content of the document. The title is used to provide a description of the subject matter. When the title is insufficiently descriptive of document content, a title extension is added, separated from the title by three hyphens. The (NASA or AIAA) accession number and the page number are included in each entry to assist the user in locating the abstract in the abstract section. If applicable, a report number is also included as an aid in identifying the document. Under any one subject heading, the accession numbers are arranged in sequence with the AIAA accession numbers appearing first.

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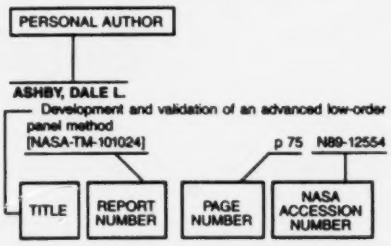

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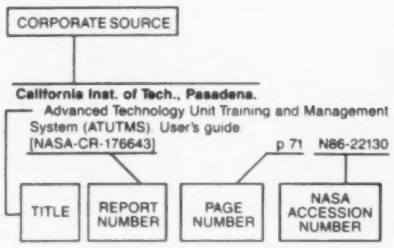

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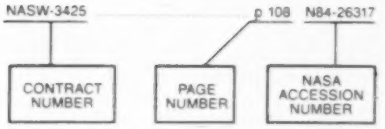

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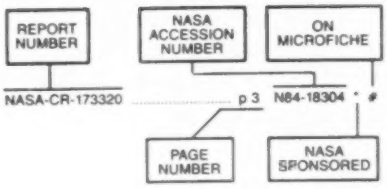

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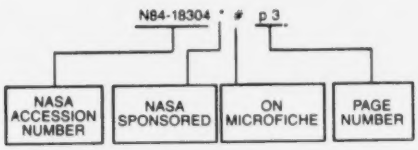

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